CSIRO

Strategic Elements

National Challenges
Addressing national challenges and opportunities, faster and better

Discovery and Delivery
Focusing and strengthening our core science capability, and delivery

One-CSIRO Foundations
Strengthening our enterprise and enhancing operational excellence

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Strategic Plan for 2007-2011

Building Momentum and Increasing Impact

Foreword

CSIRO has a special and trusted place in the hearts and minds of the Australian people. It has a record of achievement spanning more than eight decades. Our strengths are our multidisciplinary approach and scale, the quality of our science, our focus on delivering results, and our people.

CSIRO's Strategy for 2007-2011 aims to *grow our impact by delivering great science and innovative solutions for industry, society and the environment* through three major elements:

- *Addressing national challenges and opportunities, faster and better*
- *Focusing and strengthening our core science capability, and delivery*
- *Strengthening our enterprise and enhancing operational excellence.*

These three strategic elements are designed to maximise CSIRO's continuing contribution to ensuring that, as a key outcome:

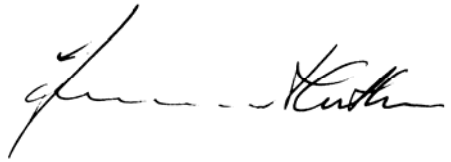
Australia has a strong capability in scientific research and development that delivers ongoing economic, social and environmental benefits, and provides science and technology solutions relevant to current and emerging national challenges and opportunities.

This Plan is about building momentum and increasing impact. It is part of our journey towards the accelerated delivery of benefits to the nation, and of continually building on the achievements of the past.

We wish to acknowledge with special thanks the valuable feedback from key stakeholders, the CSIRO Board, senior leadership and our staff in helping us define our priorities and approach.

Implementing the strategy documented in this Plan will help us consolidate CSIRO's position as Australia's leading mission-oriented research enterprise.

Geoff Garrett
Chief Executive



Terry Cutler
On behalf of the CSIRO Board

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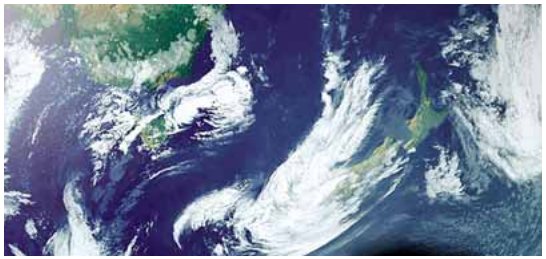

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Section A
Context and Vision

Our Core Purpose

The Science and Industry Research Act (1949) states that our primary functions are:

'to carry out scientific research for any of the following purposes:

- ***assisting Australian industry;***
- ***furthering the interests of the Australian community;***
- ***contributing to the achievement of Australian national objectives or the performance of the national and international responsibilities of the Commonwealth;***
- ***any other purpose determined by the Minister; [and] to encourage or facilitate the application or utilisation of the results of such research.'***

Everything we do stems from this Act, which is summarised in CSIRO's unifying Core Purpose, where people are the centre of all we do:

'By igniting the creative spirit of our people we deliver great science and innovative solutions for industry, society and the environment.'

For over 80 years, CSIRO has been dedicated to delivering benefit to industry and the community through world-class science.

Over the next four years, our strategy will build momentum to ensure that our key outcome is delivered, namely that:

Australia has a strong capability in scientific research and development that delivers ongoing economic, social and environmental benefits and provides science and technology solutions relevant to current and emerging national challenges and opportunities.

Our Core Purpose

Great teams **Great science** **Great impact**

Our Achievements

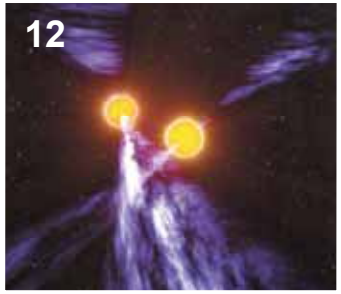
For organisations, as much as for individuals, track record is often a strong indicator of future performance.

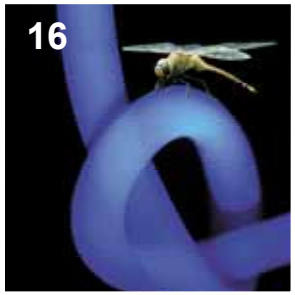
In recent years, CSIRO has continued to build on its legacy of achievements. Our enterprise has stepped up its drive to find scientific and technological solutions to help meet Australia's challenges. The scale and significance of our activities are testament to our talented, innovative and dedicated people.

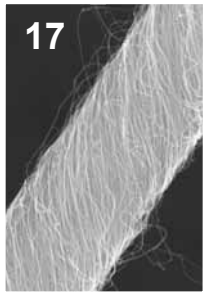
This snapshot of achievements demonstrates only some of the many activities of CSIRO over recent years. The discoveries, insights and accomplishments build on our proud heritage we carry with us into the future.

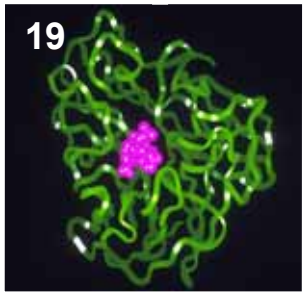
1. LAN speed record – world's fastest and most efficient wireless connection
2. Helping Australia to adapt to the impacts of climate change, nationally, regionally and locally
3. Improving Australia's lifestyle for better health with the Total Wellbeing Diet
4. Invention of a tiny fibre optic catheter for use in medical diagnostics
5. The UltraBattery, a new technology that will reduce the cost and boost the performance of batteries in hybrid electric vehicles
6. The world's first map showing Australia's known offshore mineral occurrences
7. Breakthrough sourcing of healthy omega-3 oils from land plants, which are vital for human health
8. New mineral processing technologies to establish a world-leading titanium industry
9. Developing pesticide-eating enzymes to help clean up the environment
10. A scientific first where seed dispersal science is used to combat weed invasions and protect our iconic rainforests
11. Reducing the cost of manufacturing high-performance alloy components in the automotive and other industries
12. Discovery of the first known double pulsar, nearly 2000 light years away, advancing our understanding of the universe
13. Helping stop the spread of avian influenza
14. Gene silencing to switch off diseases and stop viruses in plants and animals
15. Helping plan for the sustainable supply of water for south-west Western Australia
16. Discovery of new rubber-like materials developed from insect proteins
17. Spinning pure carbon nanotubes to create futuristic strong, light and flexible materials for advanced aerospace applications and 'smart' electronic fabrics
18. Achieving sustainability in fisheries by developing robust and effective harvest strategies
19. Applying mathematical methods to accurately measure changes in cells as a result of drugs, or diseases such as dementia
20. Development of Australia's national carbon accounting system to measure greenhouse gas sources and sinks

Our Achievements









Our Strategic Roadmap – The Journey to 2015

The journey to 2015

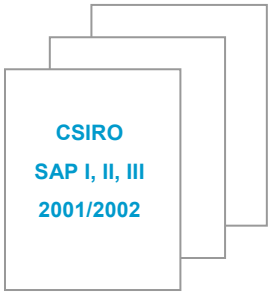
In response to a changing national and global context, at the start of the 21st century we embarked upon a new strategy. We set a vision to grow CSIRO's impact and to make what we do more relevant and of greater benefit to Australian society. To this end we projected a sequence of four coordinated plans, extending over 15 years, each episode representing a different step towards achieving our aspirations as a research enterprise with global reach:

- 2000 to 2003 was characterised by CSIRO's commitment to be more relevant to deliver greater value to our stakeholders and clients.
- 2003 to 2007 was spent refocusing on delivery and execution; building scale, flexibility and multidisciplinary approaches. This required some tough decisions as CSIRO concentrated on strategy implementation.
- 2007 to 2011 will be characterised by building momentum as the most successful paths for growing our impact become more clear.
- 2011 to 2015 will be a period of increasing impact and accelerating the delivery of national benefits.

Each of these four distinct but integrated strategic episodes are, and will be, characterised by clear strategic objectives and targets for the period. These Strategic Plans, in turn, provide the foundation for developing each of our annual Operational Plans which spell out the initiatives and activities for the coming year. They contain the detailed budgets, specific initiatives, annual performance targets; and articulate the aims, objectives and success measures for our entire portfolio of science activities for each subsequent 12 month period.

Our Strategic Roadmap – The Journey to 2015

Strategic Action Plans (SAPs) 2001-2002



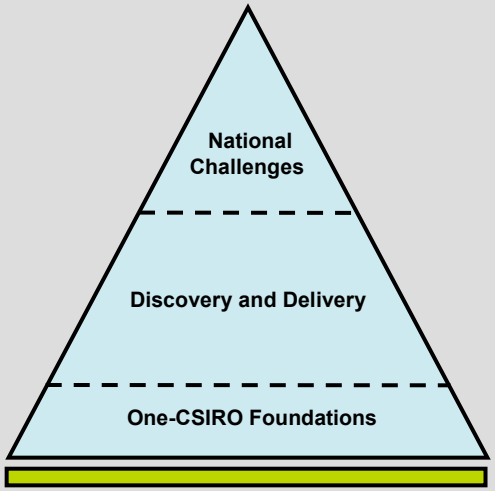
Setting a new direction

2003-2007 Strategic Plan

Delivery and Execution – Earning the right to grow

2007-2011 Strategic Plan

2007 – 2011
Building momentum and increasing impact



2011-2015 Strategic Plan

Accelerated delivery of national benefits

Building on the Foundation for Growing our Impact

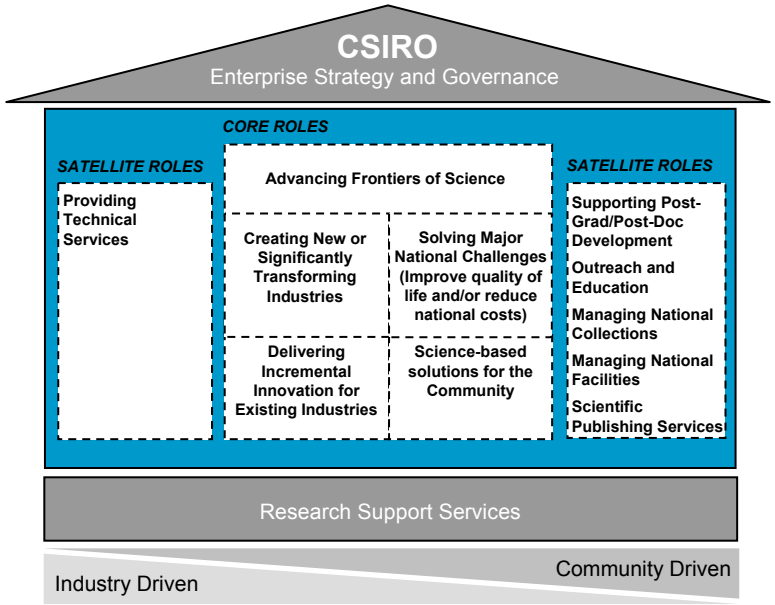
Our Six Key Messages

We address the major scientific challenges and opportunities for Australia with a **focus** on delivering quality science that makes a real difference to people's lives. We are part of the global scientific community and in **strong partnerships** with universities, other science agencies and industry we bring to bear the latest science discoveries and advances in technology to tackle the social, economic and environmental challenges that face Australia. We are an **outward-looking** and unified **One-CSIRO**, making full use of our collective and diverse strengths and **growing our impact** and relevance as a trusted source of independent scientific advice that offers practical solutions in **service to the nation**.

Focus Focus Focus	Look Out!!!
Partner or Perish	Service from Science
One- CSIRO	Go for Growth

CSIRO's differentiated role in the National Innovation System

Having a clear sense of the roles CSIRO science plays in the national innovation system helps the organisation focus its activities to deliver greater impact. Clear articulation of our differentiated roles is also critical so that others can partner with us for maximum benefit to Australia. The roles can be simply represented via a model of a house. The 'house' illustrates CSIRO's core roles, the key ('satellite') roles underpinned by effective support services (the 'floor') and a clear organisational strategy and good governance at the top (the 'roof').



Building on the Foundation for Growing our Impact

In 2001 we needed to…	We did…	We have delivered…
Clarify our role(s) in the National Innovation System	Developed the 'Role House' framework	Differentiation as an organisation
'Solve' big issues in a multidisciplinary and collaborative way	Created the National Research Flagships Program focused on national challenges and opportunities	A new model for large-scale delivery closely aligned with the National Research Priorities in 6 key areas; 250+ partnerships; and close to 30% of CSIRO investment
Demonstrate science quality	Conducted Science Reviews and implemented a new Science Investment Process	Science quality and impact; publications and citations growth; top 1% worldwide in 13 fields
Focus on uptake and relevance	Introduced a path-to-market emphasis; leveraged our IP base; improved our commercialisation processes	An expanded patents portfolio; IP revenue growth; and new companies
Transform CSIRO from disparate and disconnected institution(s) to an enterprise with global reach providing practical solutions for current and future issues	Introduced a Performance Management Framework; created cross-organisational themes for our science; and drove major organisational reform, based on our six key messages	Improved governance, accountability and transparency; increased cross-organisational collaboration; and efficiency gains

Responding to New Challenges and Opportunities

In delivering on our core purpose into the future, we face a number of new challenges and opportunities at the global, national and organisational levels:

CSIRO operates within a continually changing environment – both globally and nationally. Remaining relevant and effective within Australia's national innovation system involves charting a clear strategic pathway, fulfilling the various roles CSIRO plays, as well as remaining sufficiently nimble to effectively respond to external changes.

Global

Governments and companies worldwide have recognised that innovation and technology can set them apart from their competition. Consequently, many countries have begun executing deliberate and aggressive strategies to enhance the scale and impact of their science. Investment in research and development has accelerated significantly. Rates of total global research and development spend have increased to record levels. Governments worldwide have also begun investing more strategically, concentrating their investments in areas of national priority such as climate change. As Australia's national science agency, we recognise that if we are to continue to do globally significant science, or to develop high-impact technologies, we have to continue to prioritise our science investments.

National

Australia faces major challenges across interrelated issues: water, energy and climate change adaptation and mitigation; health-related costs such as obesity; as well as stimulating industry development. Australians produce only 2% of the world's knowledge. This is likely to decrease over the next decade or so to 1% with the dramatic growth of China's and India's innovation systems. Our national competitiveness in technology has always been heavily dependent on partnering and collaborating to gain access to knowledge generated off-shore.

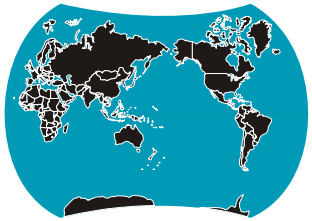
Organisational

As the largest player in Australia's innovation system, CSIRO has always had a guiding and formative role. With innovation activities increasing in universities and businesses across Australia, and increasing cohesion across the national innovation system, it has become increasingly important for CSIRO to clarify its roles and its areas of uniqueness such as in establishing the National Research Flagships, a key response to the National Research Priorities. While CSIRO has built the foundations of a robust and responsive enterprise, if we are to realise our vision of a one-CSIRO with a unifying culture, systems and process, we need to continue along our current path but with even more focus to achieve greater impact, to strengthen our cross-disciplinary approach and to embed a culture of partnering, creativity and flexibility.

Responding to New Challenges and Opportunities

In delivering our core purpose into the future, we face a number of new challenges and opportunities at the global, national and organisational levels.

CSIRO operates within a continually changing context - both globally and nationally. Remaining relevant and effective within Australia's national innovation system involves charting a clear strategic pathway, fulfilling the various roles CSIRO plays, as well as staying sufficiently nimble to effectively respond to external influences.



Global

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National

Australia faces major challenges around interrelated issues such as water, energy and climate change mitigation adaptation, health related costs such as obesity, as well as stimulating industry development and competitiveness. Australians produce only 2% of the world's knowledge which is likely to decrease over the next decade or so to 1% with the dramatic growth of China's and India's innovation systems. Our national competitiveness in technology will be increasingly and heavily dependent on partnering and collaboration, both to continue to gain access to knowledge generated off-shore and to help ensure appropriate take up of benefit to Australia in global supply chains.

CSIRO

Organisational

As the largest player in Australia's innovation system, CSIRO has long had a guiding and formative role to play in Australia. With innovation activities increasing in universities and businesses across Australia, and enhanced cohesion across the national innovation system, it has become critical for CSIRO to clarify its roles and its areas of uniqueness, such as establishing the National Research Flagships, a key response to the National Research Priorities. While CSIRO has built the foundations of a robust and responsive enterprise, if we are to realise our vision of a one-CSIRO with a unifying culture, systems and processes, we need to continue along our current path but with even more focus for greater impact, strengthen our cross-disciplinary approach and embed a culture of partnering, creativity and flexibility.

CSIRO – Our Journey

CSIRO addresses challenges that matter to Australia.

CSIRO has a special and trusted place in the hearts and minds of the Australian community, with a track record of achievement spanning more than eight decades. Our strengths are our multidisciplinary approach and scale, the quality of our science, our focus on delivery, and our people.

Our approach

We are focused on national – and global – challenges and opportunities, bringing to bear a powerful diversity of disciplines, experience and expertise. We build high-performing expert teams to attack big problems.

Effective partnering is fundamental to our success. CSIRO fosters integration between universities, overseas institutions, investors and industry. Our staff are especially adept at linking with international research to help solve Australian challenges. CSIRO scientists are valued collaborators. Knowledge sharing is what we do.

Discovery and delivery

CSIRO is a powerhouse for needs-driven innovation. The National Research Flagships exemplify this, harnessing wide-ranging talent and partnerships in bringing science of scale to bear on major issues facing the nation – in water, energy, climate change and promoting health, and in creating new industries and new jobs.

We are also building broad-based platforms of leading scientific capability, particularly in transformational biology, computational and simulation sciences, advanced materials, and sensor network technologies. Our frontier science helps lead the way, from understanding the universe and adapting to climate change through to exploring the earth's crust.

Our teams have the systems, facilities and boundary-crossing culture to support their ambitious goals. We are custodians of key national infrastructure. We work hard to be responsive and easy to deal with. Through an uncompromising focus on impact and relevance we strive to maximise the value of public investment in our research and development. We seek to lead in public sector efficiency.

Our people

CSIRO staff are positive and performance-oriented, valuing diversity. We strive to be fair and transparent. Our people believe in what they do and are passionate about it. They feel proud to work for CSIRO. Our staff and our many visitors are enriched through passion and commitment – and through learning and development opportunities. Time spent in CSIRO creates new avenues for our employees.

Australia looks to CSIRO for leadership in science and innovation. Ultimately our people are responsible for helping to embed the importance of scientific endeavour into the fabric of Australian society. We are proud when young scientists and engineers choose to work with CSIRO.

Australian Science, Australia's Future

Building Momentum and Increasing Impact

In 2007 we now need to…	Therefore we must…	So we can deliver…
Continue to lead the way in tackling a number of major national challenges and ensure the Flagships deliver on expectations Enhance our partnerships, supporting a 'Team Australia' approach to significant opportunities	Take appropriate leadership for our most significant national challenges Accelerate and expand existing Flagships and develop new Flagships Build new major partnerships Develop our national science 'hubs' Improve access to National Facilities and Collections	Practical solutions of scale, over the medium-term New scientific discoveries with enduring impact A more collaborative approach for addressing national challenges Long-term scientific capability for Australia
Continue to progress our science, quality and focus Ramp up delivery of impact from our science	Embed and improve our science investment processes Extend the Science Review program Develop new approaches to accelerate science and technology adoption	Increase in the scale, quality and timeframe of scientific solutions More flexible and faster uptake of CSIRO science Increased community trust and respect
Embed a distinctive CSIRO culture founded on strong leadership, transformational science and delivered through effective partnerships and collaboration to achieve the greatest impact for Australia	Rejuvenate a culture of innovation, collaboration and partnering where the delivery of great science with impact is key Consolidate matrix management	A step change improvement in efficiency and effectiveness of cross-organisational systems and processes A sustainable, high-performing, world-class enterprise, with global reach

Science for Australia's Benefit

Building the momentum of our science and its delivery during 2007-11 is key to enhancing the foundations that underpin CSIRO's distinctive national and global role. This journey, with our partners, will remain dedicated to addressing wide-ranging challenges that matter to Australia:

- ✓ New technologies for the clean and secure production of energy from fossil fuels and renewable sources
- ✓ Practical solutions to help Australia adapt to climate change
- ✓ An Australia safe from emerging and future biological threats
- ✓ World-leading ICT for products and services to underpin industrial competitiveness
- ✓ Substantially increased social, economic and environmental benefits from water
- ✓ Growing food exports as well as increased production of healthier and safer foods
- ✓ Australia's biodiversity is well managed for present and future benefit
- ✓ Sustainable access to the vast economic and social wealth of our oceans, whilst preserving their environmental value
- ✓ New industries based on novel industrial materials and biomaterials from renewable sources
- ✓ Prosperous communities through sustainable and wealth-creating use of natural, built and human resources
- ✓ A greener agricultural industry with increased longer term economic benefit
- ✓ Improved health and wellbeing of Australians through better prevention, early detection and intervention
- ✓ Niche products and new Australian companies for a globally competitive manufacturing industry
- ✓ Australia's competitive edge in the global minerals market is significantly enhanced as a result of new technologies for exploration, processing and light metals production
- ✓ A safer and more secure society
- ✓ World-leading astronomy with increased investment in Australia.

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Section B

Focus for 2007 to 2011

The Strategic Elements

CSIRO's strategy to 2011 is about building momentum and increasing impact. It is also about continuing to embed the core components of the previous strategic plan as part of our 21st century 15-year strategic framework. In the national and global context, this approach will require significant focus around strong leadership in the National Innovation System as well as effective partnerships both nationally and globally for unprecedented scientific impact for the nation.

The key elements of CSIRO's strategy to 2011 are framed by our overarching aspiration, as defined in our core purpose, and our underpinning six key messages. The core purpose defines our continuing and original mission which we will foster into the future. The six key messages are part of our broader strategy of differentiation for the next decade based on our enterprise behaviours.

Three Elements

CSIRO's strategy through to 2011 consists of three elements:

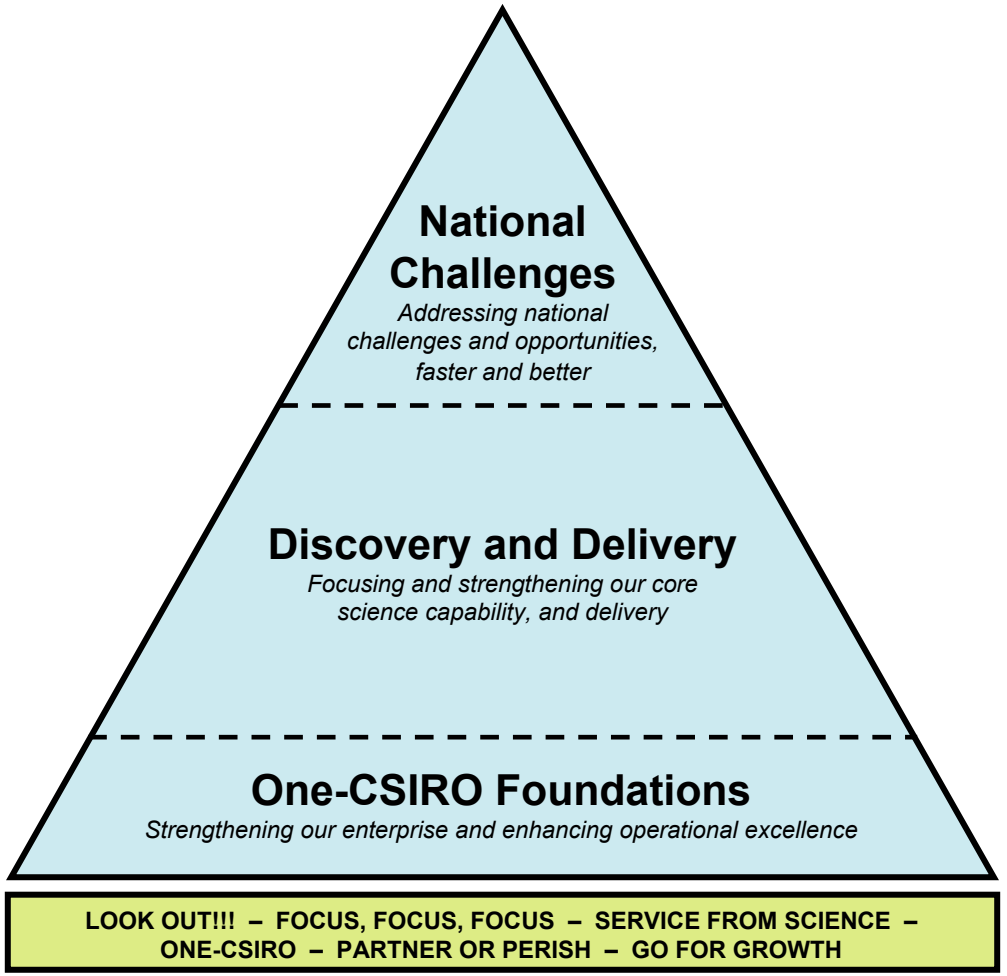
- *National Challenges* – by addressing national challenges and opportunities faster and better, by accelerating and expanding our Flagships and by focusing on partnerships nationally and internationally, we will find new solutions to big problems in water, energy, climate, health, industry, and the environment.
- *Discovery and Delivery* – by focusing and strengthening our core science capability we will enhance the quality and the transformational potential of our science, while also improving the sustainability of our national facilities and collections. By improving our delivery of science through better business practices, accelerated adoption process and enhancing communication, we will also increase our impact in Australian society.
- *One-CSIRO Foundations* – by strengthening our enterprise and enhancing operational excellence, we will: foster an innovative, collaborative, and performance-based environment; develop and adopt common systems, structures and processes that support our matrix enterprise; and renew our focus on occupational health and safety.

Each of these elements will be implemented through a number of different strategic initiatives and corresponding strategic objectives.

The Strategic Elements

Growing our Impact

Delivering great science and innovative solutions for industry, society and the environment



Strategic Initiatives and Objectives

Summary of our Strategy to 2007-2011

The strategic initiatives and objectives of the 2007-2011 Strategic Plan are listed on the facing page.

Supporting each initiative are two or three objectives. In total, the 2007-2011 strategic plan encompasses five initiatives and twelve objectives. These initiatives and objectives provide the essential components that will guide our organisation over the next four years.

The Path 2007 to 2011
Building Momentum and Increasing Impact

STRATEGIC ELEMENTS	*STRATEGIC INITIATIVES*	*STRATEGIC OBJECTIVES*
National Challenges ***Addressing national challenges and opportunities, faster and better***	**1.1 Building on Flagship Success**	**1.1.1 Accelerating and Expanding Flagships** – Grow targeted National Flagships to more rapidly address key national challenges and opportunities. **1.1.2 Growing Flagship Collaborations** – Accelerate our delivery of Flagship goals by increasing the level of collaboration with world-leading research partners, both nationally and internationally.
	1.2 Power Partnerships	**1.2.1 Building Major Partnerships** – Boost science capability to achieve more effective science and technology solutions for the Australian community, industry and the environment through targeted partnering, alliances and ventures. **1.2.2 Developing Science Hubs through Co-locations** – Continue to build nationally significant integrated clusters of science capabilities with others in the National Innovation System to facilitate the development of critical mass, to help enhance science delivery for Australia.
Discovery and Delivery ***Focusing and strengthening our core science capability, and delivery***	**2.1 Focused Science**	**2.1.1 Progressing Science Direction Setting** – Continue to focus CSIRO's science investment, capability development and performance in areas of greatest impact and relevance. **2.1.2 Building Transformational Capability Platforms** – Ensure long-term sustainability and future impact of the organisation by strengthening vital cross-organisational capabilities in transformational biology, advanced materials, computational and simulation sciences, and sensor network technologies. **2.1.3 Ensuring Sustainable National Facilities and Collections** – Management and delivery of national and international research infrastructure that underpins the CSIRO and National Innovation System research portfolio.
	2.2 Increased Adoption	**2.2.1 Developing our Business** – A step-change improvement in our business relationships to ensure effective science and technology uptake, sustainably. **2.2.2 Accelerating Science and Technology Transfer** – Ensure effective technology transfer to partners by continuing to develop flexible and fast adoption pathways. **2.2.3 Enhancing Communications** – Promote the contribution of science in driving innovation and support the delivery of societal benefit from CSIRO science.
One-CSIRO Foundations ***Strengthening our enterprise and enhancing operational excellence***	**3.1 People and Organisational Development**	**3.1.1 Nurturing our Innovative Culture** – Foster a safe environment where innovation, collaboration, flexibility and performance flourish. **3.1.2 Working Effectively and Efficiently in our Enterprise** – Utilise common systems, structures and improved processes to support our matrix operations and optimise the use of our facilities, equipment and information assets.

LOOK OUT!!! – FOCUS, FOCUS, FOCUS – SERVICE FROM SCIENCE – ONE-CSIRO – PARTNER OR PERISH – GO FOR GROWTH

National Challenges

CSIRO's strategy through to 2011 includes two strategic initiatives to improve the organisation's capacity to address national challenges and opportunities: an initiative to accelerate and expand Flagships; and, an initiative to create new and stronger partnerships with other institutions.

Building on Flagship Success (Strategic Initiative 1.1)

1.1.1 Accelerating and Expanding Flagships – Grow targeted National Flagships to more rapidly address key national challenges and opportunities.

1.1.2 Growing Flagship Collaborations – Accelerate our delivery of Flagship goals by increasing the level of collaboration with world-leading research partners, both nationally and internationally.

Value to Australia

Accelerated solutions to key national challenges – such as energy, water, health, and climate change – for faster direct benefits to Australia.

A more collaborative and cohesive research base in Australia means that our research communities will collectively achieve much more for every dollar invested.

Power Partnerships (Strategic Initiative 1.2)

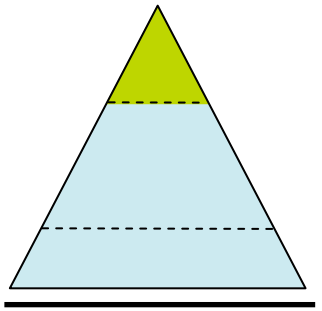
1.2.1 Building Major Partnerships – Boost science capability to achieve more effective science and technology solutions for the Australian community, industry and the environment through targeted partnering, alliances and ventures.

1.2.2 Developing Science Hubs through Co-locations – Continue to build nationally significant integrated clusters of science capabilities with others in the National Innovation System to facilitate the development of critical mass, to help enhance science delivery for Australia.

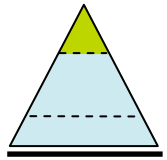
Value to Australia

A more integrated and responsive science infrastructure in Australia.

More Australian institutions will be able to access CSIRO to support their own major activities for solving Australia's challenges.



Objective 1.1.1
Accelerating and Expanding Flagships



Aspiration

Grow targeted National Flagships to more rapidly address key national challenges and opportunities.

Activities

- *Water for a Healthy Country Flagship* – Accelerate the Water Resources Observation Network for improved decision-making around Australia's water
- *Energy Transformed Flagship* – Expand the transport fuels area for cost effective and low-emissions energy security
- *Preventative-Health Flagship* – Focus on the obesity program to help address the national obesity crisis including childhood obesity
- *Wealth from Oceans Flagship* – Incorporate sustainable fisheries research
- *New Flagships* – Establish the Climate Adaptation, Minerals Down Under and Niche Manufacturing Flagships

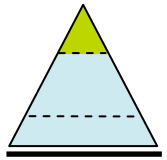
Approach

- We will adopt the recommendations of the 2006 Flagship Review panel, specifically:
  - enhance processes for articulating and supporting 'path to impact'
  - map and integrate capability needs of Flagships with broader CSIRO capability planning
  - enhance communication to maximise impact
  - develop better mechanisms for integration of social science research.
- We will continue to focus investment through the Flagships to tackle Australia's most pressing problems, as articulated in the National Research Priorities
- We will expand or accelerate activities in existing Flagships
- We will look to build, where appropriate, on the successful Flagship model to tackle additional major opportunities for Australian community and industry

Outcomes

- Three new Flagships established and delivering in the targeted areas of climate change adaptation, minerals and manufacturing
- Delivery of practical solutions from existing Flagships has been expanded, for example in the areas of low emission transport fuels and childhood obesity
- Flagships are increasingly efficient and effective in the delivery of their goals

Objective 1.1.2
Growing Flagship Collaboration



Aspiration

Accelerate our delivery of Flagship goals by increasing the level of collaboration with world leading partners, both nationally and internationally.

Activities

- Increase collaboration across the National Innovation System to broaden the scope of collaborative projects as part of existing and new Flagship initiatives by:
  - Extending existing collaborative programs and other talent and industry focused initiatives
  - Broadening the CSIRO Postdoctoral Program and provide for more early-career high-achieving scientists and further develop our mid-career scientists
  - Creating a Smart Small to Medium Enterprise Program that will better integrate these enterprises in the delivery and utilisation of Flagship technologies.

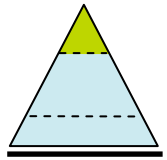
Approach

- We will focus on larger collaborative research and delivery clusters for developing new partnerships as part of existing and new Flagships
- We will broaden the participation of collaborative projects to industrial (especially with small to medium enterprises) and international partners
- We will focus on developing critical skills in relevant science areas that are more closely linked to industry needs

Outcomes

- An increased number of Australian students, mid career scientists, science leaders & international researchers working on major national challenges and opportunities aligned with Flagship goals
- A wider impact from Flagship programs through broader collaboration, especially through Small to Medium Enterprise partnerships

Objective 1.2.1
Building Major Partnerships



Aspiration

Boost science capability to achieve more effective science and technology solutions for the Australian community, industry and the environment through targeted partnering, alliances and ventures.

Activities such as

- *The Centre for Australian Weather and Climate Research* – A joint research operation with the Australian Bureau of Meteorology to underpin national solutions to our climate change challenges
- *National security initiative* – A CSIRO contribution to the Public Agencies Collaborative Counter-Terrorism Program
- *Biosecurity network* – CSIRO science underpinning the outcomes of the emerging Australian Biosecurity System
- *Square Kilometre Array* – Intensify work with national and global partners to maximise outcomes for Australian science, industry and society from its engagement in the international program
- *Other focused activities such as* – Energy alliances: engagement in the Western Australia Energy Research Alliance, the Australian Gas Centre and hydrogen technology cluster; partnership with the Bureau of Meteorology around the Water Resources Observation Network; Sports technologies: partnering with the Australian Institute of Sport to develop world leading and innovative solutions for our elite athletes

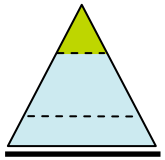
Approach

- We will engage in targeted partnerships where CSIRO is not necessarily the lead player, but where it is able to contribute an important supporting role in solving a national or international challenge
- As part of a broader partnering strategy, we will draw from our core capabilities in science and technology to form partnerships where our involvement will create critical mass in scientific capability to address national goals

Outcomes

- An increased number of strategic research partnerships, delivering solutions to national challenges and opportunities
- Technologies are developed and deployed more quickly and effectively to Australian society

Objective 1.2.2
Developing Science Hubs through Co-locations



Aspiration

Continue to build nationally significant integrated clusters of science capabilities with others in the National Innovation System to facilitate the development of critical mass, to help enhance science delivery for Australia.

Activities such as

Identification of Science Hub opportunities – We will collaborate with other members of the National Innovation System to identify and build existing and new clusters around key capabilities, for example:

- Minerals and Chemistry Precinct at Waterford, Western Australia
- Queensland Centre for Advanced Technologies – Mining cluster in Pullenvale, Queensland
- Clayton Consolidation – Niche manufacturing and climate sciences cluster in Clayton, Victoria
- Tropical Science and Innovation Precinct – Tropical cluster in Townsville, Queensland
- Australian Resources Research Centre in Western Australia.

Approach

- Through appropriate consolidation, we will increase the scale and efficiency of our operations – both Flagship and non-Flagship – aimed at solving national challenges
- We will aim to establish significant national clusters through co-location of facilities and capabilities
- We will strengthen the role of regional laboratories in technology transfer

Outcomes

- Increased access to world-class research infrastructure by CSIRO, universities and industry results in more effective scientific collaborations and delivery
- Better and faster development and adoption of technology through additional physical co-location and partnerships
- Improved alignment of capital investment to priority research areas
- Operating and capital cost-efficiencies realised through sharing of research and support resources

Discovery and Delivery

CSIRO's strategy through to 2011 includes two strategic initiatives to maintain and renew science quality and improve the organisation's capacity for scientific discovery; and deliver the results of its science into Australian communities and organisations.

Focused Science (Strategic Initiative 2.1)

2.1.1 Progressing Science Direction Setting – Continue to focus CSIRO's science investment, capability development and performance in areas of greatest impact and relevance.

2.1.2 Building Transformational Capability Platforms – Ensure long-term sustainability and future impact of the organisation by strengthening vital cross-organisational capabilities in transformational biology, advanced materials, computational and simulation sciences, and sensor network technologies.

- *Transformational biology* – Combining human, plant, and animal biology with genomics, phenomics, and whole-of-system approaches
- *Materials science* – Combining physics, engineering, chemistry and biology to develop the materials of the future
- *Computational and simulation sciences* – Building broad scale capability and applications across CSIRO's diverse areas of activity
- *Sensor network technologies* – Transforming our ability to monitor and control our environment

2.1.3 Ensuring Sustainable National Facilities and Collections – Management and delivery of national and international research infrastructure that underpins the CSIRO and National Innovation System research portfolio.

Value to Australia

A focused approach to our science means greater scientific and community impact, greater relevance for Australia, and greater international credibility.

Creates the platforms with scientific excellence to provide options and solutions for Australia in the future.

Increased Adoption (Strategic Initiative 2.2)

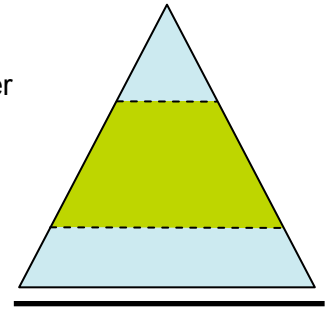
2.2.1 Developing our Business – A step-change improvement in our business relationships to ensure effective science and technology uptake, sustainably.

2.2.2 Accelerating Science and Technology Transfer – Ensure effective technology transfer to partners by developing flexible and fast adoption pathways.

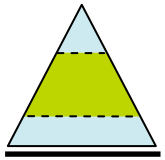
2.2.3 Enhancing Communications – Promote the contribution of science in driving innovation and support the delivery of societal benefit from CSIRO science.

Value to Australia

A stronger focus on impact means faster take-up of CSIRO discoveries in the community, more effective business relationships, and an Australian community that values science and is equipped to adapt rapidly to new developments in technology.



Objective 2.1.1
Progressing Science Direction Setting



Aspiration

Continue to focus CSIRO's science investment, capability development and performance in areas of greatest impact and relevance.

Activities

- *Embed science direction setting* – Embed and improve the science investment mechanisms set up under the 2003-07 Strategy including building on cross-cutting science strategies (ie. manufacturing, bioeconomy, agricultural sustainability)
- *Capability development* – Implement coordinated capability planning and development (including skills renewal) to address current and future needs in support of science directions
- *Science excellence* – Continue to develop mechanisms which support and promote CSIRO's scientific excellence for future impact
- *Whole-of-investment approach* – Finalise integration of the Science Investment Process with other organisational processes (including path to impact and market)
- International engagement – Develop a more deliberate approach to international collaboration

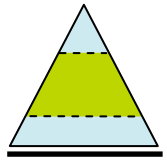
Approach

- We will continue to build a balanced portfolio that delivers environmental, social and economic impact (See Section C)
- We will embed and improve our Science Investment Process, ensuring a whole-of-investment (including Capex) approach to investment planning
- We will intensify our engagement with key stakeholders and partners in determining our science direction
- We will implement a more deliberate international engagement strategy
- We will define future capital requirements and investments in conjunction with broader capability planning

Outcomes

- Increased scale and quality of CSIRO science
- Increased targeting of investment to develop scientific capability most relevant for Australia
- CSIRO's distinctive and complementary roles with other players in the National Innovation System is clearly established and duplications minimised

Objective 2.1.2
Building Transformational Capability Platforms



Aspiration

Ensure long-term sustainability and future impact of the organisation by strengthening vital cross-organisational capabilities in transformational biology, advanced materials, computational and simulation sciences and sensor network technologies.

Activities

- *Targeted capability renewal in four cross-organisational platforms*
- *Transformational biology* – Science programs that combine human, plant, and animal biology with genomics, phenomics and whole-of-system approaches
- *Materials science* – Building large-scale programs that combine physics, engineering, chemistry and biology to develop the materials of the future
- *Computational and simulation sciences* – Develop broad-scale computation capability for diverse and practical applications for industry and community
- *Sensor network technologies* – Combine scientific expertise for large-scale deployment of sensor applications

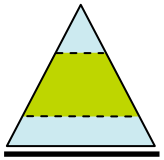
Approach

- We will expand our efforts in cross-disciplinary areas of science where CSIRO is positioned to develop unique capabilities
- We will ensure the sustainability and future impact of our organisation by building core capabilities and developing skills for addressing future challenges
- We will ensure sufficient capital and equipment are deployed to support core capability development

Outcomes

- CSIRO is prepared for, and can respond to, the next big Australian challenge or opportunity
- Strong capability platforms (people, skills, networks, facilities) have been established in transformational biology, materials science, computational and simulation sciences and sensor network technologies

Objective 2.1.3
Ensuring Sustainable National Facilities and Collections



Aspiration

Management and delivery of national and international research infrastructure that underpins the CSIRO and National Innovation System research portfolio.

Activities

- *Australian Animal Health Laboratory* – Build diagnostic capability and longer term sustainability for a safe Australia
- *Marine Research Vessel* – Update ageing facility to address key questions of the marine environment
- *Australian Telescope National Facility* – Operate Australia's national radio astronomy facilities to position Australia for the Square Kilometre Array and in line with key partnerships (see 1.2.1)
- *CSIRO biological collections* – Coordinate the management of Australia's national biological collections, digitise them, and introduce a sustainable model for long-term curation, research value and opportunities

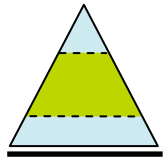
Approach

- We will adopt a strategic approach in our custodianship of research infrastructure in order to maximise efficiency and robustness of national facilities
- We will retain our leading role as an operator, developer and user of National Facilities
- We will, with our partners, develop management arrangements for national infrastructure that are financially sustainable

Outcomes

- Increased and more widespread access to, and utilisation of, National Facilities and Collections
- National research infrastructure continues to deliver long-term high-impact benefit to Australia
- The National Facilities and Collections are financially sustainable

Objective 2.2.1
Developing our Business



Aspiration

A step-change improvement in our business relationships to ensure effective science and technology uptake, sustainably.

Activities

- *Relationship management* – Embed a customer service culture and develop multi-level client engagement systems and networks
- *Build business development capability:*
    - enhance our business processes, customer information management and networks for better decision-making, organisation-wide
    - Improve the efficiency and effectiveness of the deployment of business development resources through skills development and training
    - International engagement – develop a more deliberate and focused approach to international business engagement.
- *Small to Medium Enterprise engagement* – Increase impact for small to medium enterprises through a range of support programs

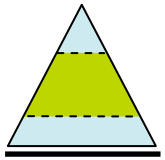
Approach

- We will increase our impact by developing a relationship-based approach to business development
- We will establish clarity of purpose – to deliver impact for Australia – for us and for our partners and clients
- We will increase our ability to draw on market intelligence analysis for positioning CSIRO for maximum impact

Outcomes

- Clients and key partners will have stronger and more productive relationships with CSIRO
- Significant international connections will enhance Australia's access to global research and technology
- Substantive engagement with Small to Medium Enterprises will contribute to more effective technology adoption
- CSIRO's revenue streams from external engagement will grow

Objective 2.2.2
Accelerating Science and Technology Transfer



Aspiration

Ensure effective technology transfer to partners by continuing to develop flexible and fast adoption pathways.

Activities

- *Business model clarity* – Develop and use a whole-of-system customised approach to the engagement model with our partners
- *Paths to impact* – Develop a wider range of flexible delivery mechanisms for transferring CSIRO technologies to end users, in a timely, more transparent and effective way
- *Investment and Business Development interaction* – Ensure closer linkages between investment decisions and path to market plans
- *IP management* – Create a principled framework for IP rights, protection and engagement with our partners, which is capable of adapting to sectoral needs
- *Commercialisation* – Build from a strong foundation of improved commercialisation processes to increase impact and adoption

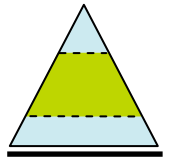
Approach

- We will identify paths to impact before commencing research by conducting freedom to operate and competitor product searches, defining outcomes and developing roadmaps
- We will ensure our internal processes are as efficient as possible to expedite technology transfer from CSIRO
- We will encourage a broader understanding of intellectual property to encompass concepts and practices around 'knowledge' and 'know-how'
- We will make customer relationship management, intellectual property management and commercialisation core competencies for CSIRO

Outcomes

- Better and faster technology uptake and adoption, with corresponding increased satisfaction from our clients and partners
- CSIRO's reputation for effective delivery of quality S&T outcomes will grow as a result of enhanced knowledge management (including IP practices and promotion)
- Appropriate returns from the transfer and commercialisation of CSIRO IP will continue to increase, for investment back into our science

Objective 2.2.3
Enhancing Communications



Aspiration

Promote the contribution of science in driving innovation and support the delivery of societal benefit from CSIRO science.

Activities

- *Strategic Prioritisation* – Align communication and marketing resources to assist in the achievement of enterprise goals and the delivery of theme outcomes
- *Productive Partnerships* – Actively position CSIRO as a responsive, collaborative and innovative global partner
- *Education and Outreach* – Foster interest in science and understanding of its value in the Australian community
- *Science to Inform Decisions* – Inform public debate on national and international science-related issues and provide input to policy processes

Approach

- We will drive more effective priority-based cross-organisational communication and marketing investment to deliver greater impact from science discoveries
- We will harness market intelligence and stakeholder feedback to inform our communication strategy and improve our business and community relationships
- We will promote science awareness, inspiring science teaching and excitement about careers in science
- We will reaffirm the trust and support placed in CSIRO science by the community and government

Outcomes

- The Australian community and education sector have an increased appreciation of the value of science and science-based solutions
- CSIRO's reputation is enhanced as an internationally-respected scientific enterprise and a source of trusted advice to governments, industry and the community

One-CSIRO Foundations

CSIRO's strategy through to 2011 includes a key strategic initiative to underpin the organisation's enterprise foundations:

People and Organisational Development
(Strategic Initiative 3.1)

3.1.1 Nurturing our Innovative Culture – Foster a safe environment where innovation, collaboration, flexibility and performance flourish.

3.1.2 Working Effectively and Efficiently in our Enterprise – Utilise common systems, structures and improved processes to support our matrix operations and optimise the use of our facilities, equipment and information assets.

In order to address the challenges Australia faces, CSIRO increasingly needs to promote enterprise-wide behaviours and to provide systems, processes and structures to enable the conduct and delivery of its science. This means continuing to build on organisational improvements initiated in the 2001 strategic action plans and continued in the 2003-2007 plan.

Our aspiration is to provide a workplace that promotes world-class team performance and creativity and that is enriched by the passion our staff have to make a positive difference to the future of Australia.

In order to maximise its value to Australia, CSIRO must take a systemic approach to fostering innovation, delivery and management.

Two pragmatic challenges are associated with implementation. The first is how to deal with the human dimensions that impinge on innovation: leadership, culture, diversity, training and career development, recruitment, and rewards and recognition. The second is the structural and process challenges associated with structuring, communicating and evaluating innovative practice.

Successful implementation of systems approaches that support the enterprise's foundations will help position CSIRO in the vanguard of global scientific endeavour in terms of science excellence, relevance and impact.

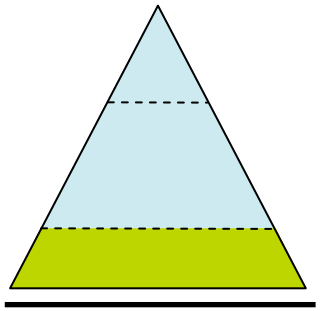
To continue to take good care of our people and the environment in conducting our business, we will move to the next level in Health, Safety and Environmental practices.

Value to Australia

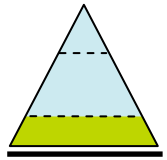
Igniting the creative spirit of our people will enhance what CSIRO can achieve for Australia.

Improving the performance and effectiveness of our organisation will also increase the benefits we deliver.

Supporting flexibility and diversity in our workforce will improve our responsiveness and our capacity to help solve Australia's problems.



Objective 3.1.1
Nurturing our Innovative Culture



Aspiration

Foster a safe environment where innovation, collaboration, flexibility and performance flourish.

Activities

- *Clarification of Values and Actions* – Articulate what we value at CSIRO and the behaviours to successfully implement our strategy
- *Align performance and recognition processes* – Clarify what we value and our behavioural expectations and incorporate these in our performance management, rewards, consequences and recognition systems
- *Increase organisational agility* – Maximise our capacity to deliver wide ranging outcomes
- *Corporate responsibility programs* – Move to the next level in Health, Safety and Environment practices to ensure a safe, healthy and environmentally responsible enterprise
- *People Development* – Building the excellence of our workforce through proactive recruitment and retention, career and leadership development and diversity

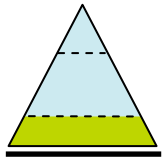
Approach

- We will continue to support, reward and recognise behaviours that improve organisational performance and – consistent with our strategy – deliver outcomes for Australia
- We will continue to embed the six key messages as the basis for performance management, reward and recognition processes and other organisational systems
- In order to successfully implement our strategy, clarify and communicate what we value and our behavioural expectations and incorporate these into relevant people management systems
- We will actively promote a safe and productive work environment which attracts and retains the best and brightest to CSIRO
- We will foster a flexible, adaptable and diverse workforce able to create and work in teams across boundaries
- We will provide additional dedicated support for early career researchers and holistic career management for an 'industry ready' workforce

Outcomes

- Staff are clear about their roles and responsibilities and how their individual actions deliver to CSIRO's objectives
- Everyday behaviours reflect our six key messages, core purpose and what we value at CSIRO
- CSIRO acts as an innovative, collaborative, outcome focused and outward-looking organisation
- Customers see a fully consistent and coherent approach by CSIRO

Objective 3.1.2
Working Effectively and Efficiently in our Enterprise



Aspiration

Utilise common systems, structures and improved processes to support our matrix operations and optimise the use of our facilities, equipment and information assets.

Activities

- *Implement the 'matrix' environment* – Define and implement CSIRO's matrix roles, responsibilities and accountabilities
- *Capability management* – Clear and consistent processes for maintaining and building essential capabilities
- *Next-generation information management* – Improve utilisation of data and information assets for science data/information; projects and portfolios; people, technology and infrastructure assets
- *Enterprise processes* – Delivering organisation-wide systems and processes that increase the effectiveness and efficiency of support services, including the Business Processes and Enabling Technology Replacement (BETR) program
- *Project management* – Refine and ensure full implementation of CSIRO's approach to project management
- *Coordinated change programs* – Ensure a coordinated approach to implementation of critical change initiatives

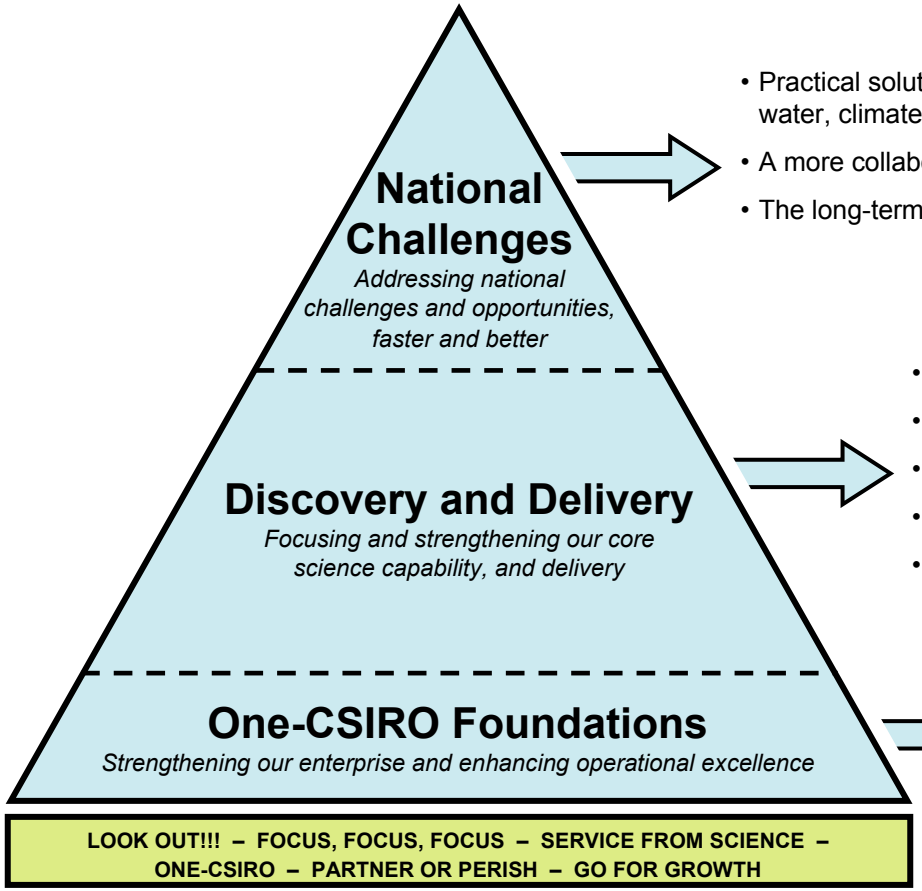
Approach

- We will deliver support systems to increase organisational effectiveness and enhance enterprise-wide research and development management capability
- We will implement programs to assist cross-boundary work
- We will continue to build role clarity within our organisation to reduce cross-boundary barriers
- We will implement systems and processes to more effectively utilise the depth and richness of organisational knowledge
- We will conduct safe, healthy and environmentally responsible research programs and other organisational-level operations

Outcomes

- Smoother and more effective operations of our core business, with reduced transaction costs
- Clarity for staff around performance expectations, with corresponding quality and transparent performance management
- Continuously increasing cross-disciplinary work in CSIRO
- Safer, healthier and more environmentally responsible research programs

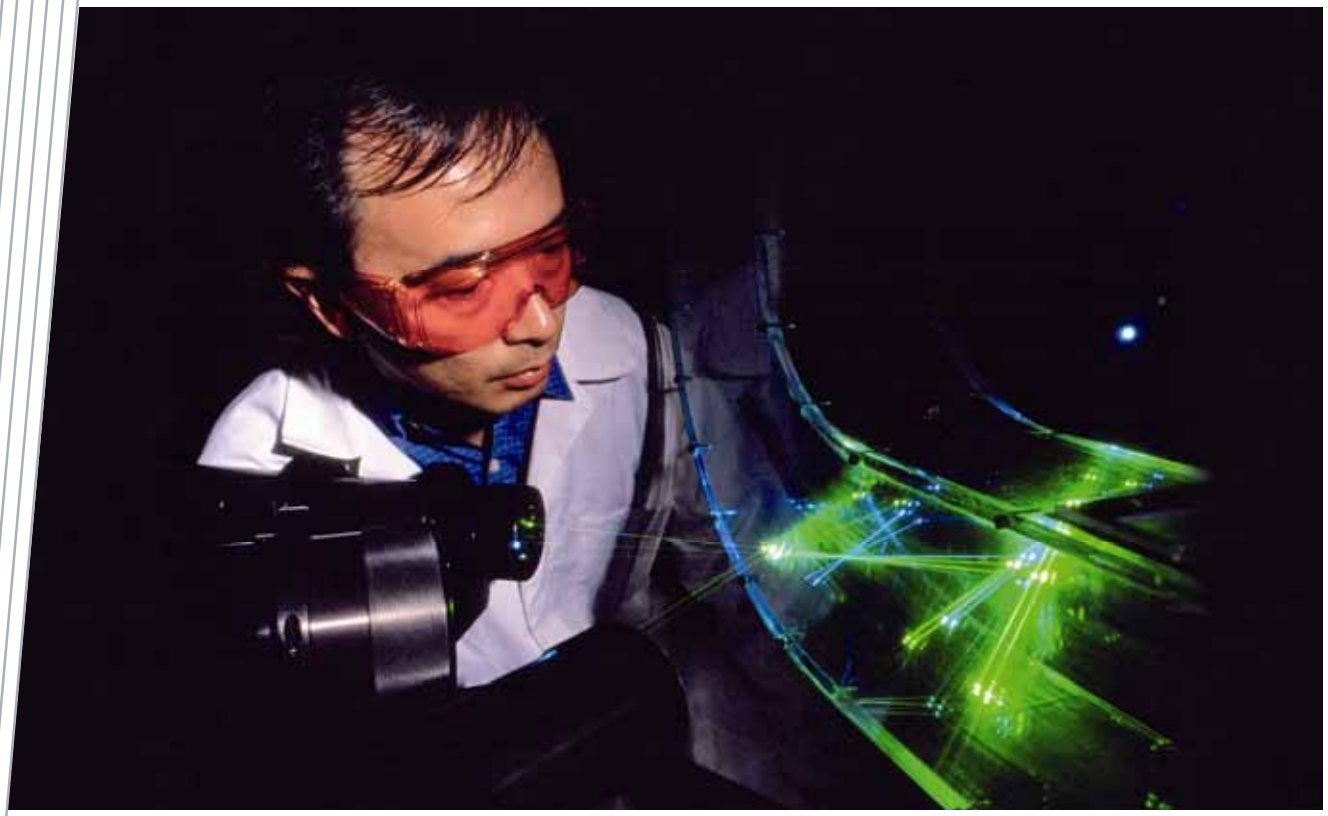
In summary, over this period CSIRO will deliver…

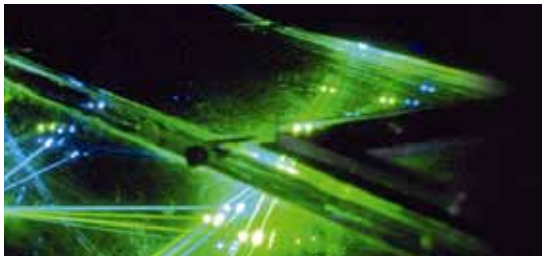


- Practical solutions of scale, particularly in areas such as energy, water, climate, health and industry development
- A more collaborative approach for addressing national challenges
- The long-term scientific capability for Australia to tackle future national challenges

- Continued progress in building our science quality and capabilities
- New scientific discoveries with enduring impact
- Further increasing the scale, quality and speed of our scientific solutions
- More flexible and faster uptake of CSIRO science
- Enhanced community benefits from science

- A sustainable enterprise founded on collaboration, innovation and performance
- Step-change improvement in efficiency and effectiveness of cross-organisational systems and processes
- An operating environment and culture aligned with organisational strategy and supporting the delivery of great science





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Section C

Broad Directions for CSIRO Science

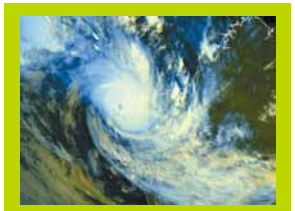
CSIRO's Roles in the National Innovation System

Clarity around roles is vital to increase the impact of CSIRO. Having a clear sense of the roles CSIRO science plays within the Australian innovation system will help the organisation focus its activities to deliver greater impact. Clear articulation of CSIRO's differentiated roles is also critical so that others can partner, collaborate and specialise for maximum benefit to Australia.

Core roles

CSIRO's core roles are as follows:

- addressing major national challenges and opportunities, through harnessing the breadth and depth of our expertise
- creating new or significantly transforming industries to increase the competitiveness and sustainability of Australian industry
- delivering incremental innovation to improve the efficiency and competitiveness of existing industries
- providing fact-based solutions that meet community needs and knowledge that informs Government policy
- advancing the frontiers of science, an essential component of maintaining long-term capability.



Understanding climate change

Satellite roles

CSIRO also performs a number of satellite roles that deliver value to Australia:

- supporting the development of postgraduate students and post-doctoral fellows
- outreach and education programs (Double Helix, CSIROSECs)
- managing national collections and facilities
- scientific publishing services (scientific journals, technical books and CDs)
- providing consulting and technical services (fire testing, building and construction, quarantine testing, fish diseases).

Training student researchers

Enabling functions

Certain enabling functions are necessary to enable the Organisation to deliver on its core and satellite roles. In CSIRO the two most important enabling functions are:

- providing Research Support Services (eg. Human resources, Communications, Finance, Information Technology/Services)
- enterprise strategy and governance (eg. Executive management and CSIRO Board).

Supporting our staff

The Role House

Rubber-like materials from insects

Integrated titanium metal industry for Australia

Light weight concrete to boost our construction industry

CSIRO

Enterprise Strategy and Governance

CORE ROLES

SATELLITE ROLES

Providing Technical Services

Advancing Frontiers of Science

Creating New or Significantly Transforming Industries

Solving Major National Challenges (Improve quality of life and/or reduce national costs)

Delivering Incremental Innovation for Existing Industries

Science-based solutions for the Community

SATELLITE ROLES

Supporting Post-Grad/Post-Doc Development

Outreach and Education

Managing National Collections

Managing National Facilities

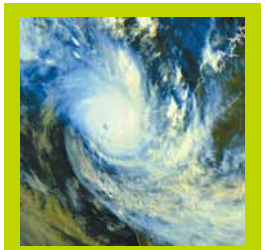
Scientific Publishing Services

Research Support Services

Industry Driven

Community Driven

Training student researchers



Understanding climate change

Medical diagnostics to overcome potentially fatal conditions

The National Research Flagships

More than ever before in our history, Australia faces challenges in critical areas such as water, climate, clean energy, and health as well as industry development in a competitive global environment. Effective solutions to these complex issues call for innovative partnerships that harness national expertise on an ambitious scale.

The National Research Flagship program is one of the largest scientific research programs ever undertaken in Australia – with the total investment to 2010-11 expected to be between $1 billion and $1.5 billion.

By establishing the National Research Flagships in energy, water, health, light metals, oceans, food and, more recently, climate adaptation, minerals exploration and niche manufacturing, we have moved beyond the traditional models of science. Flagships recognise that complex large-scale challenges require sophisticated cross-boundary responses that can only be delivered by bringing together the best and the brightest from across the Australian research and development system.

Flagships are focused on outcomes. They are committed to delivering research solutions that target clearly defined goals. These objectives have been framed by a compelling understanding of the needs of our research users, our customers and the community. What distinguishes Flagships from other research initiatives is their larger scale, longer timeframes and stronger focus on adoption of research outputs.

Collaboration is a key component of Flagships and ensures that Australia exploits the full breadth and depth of its research expertise. Partnerships provide the pathways for Flagship research to be taken up by industries and communities and applied to deliver economic, environmental and social benefits for the nation.

The National Research Flagships

The National Research Flagships are multidisciplinary research partnerships that harness capabilities across CSIRO and external collaborators to tackle big, audacious goals in areas of major national significance. Their larger scale, longer timeframes and clear focus on adoption of research outputs are designed to maximise the achievement of their goals.

Energy Transformed Flagship – To halve greenhouse emissions and double the efficiency of the nation's new energy generation, supply and end use and to position Australia for a future hydrogen economy.

Food Futures Flagship – To transform international competitiveness and add $3 billion annually to the Australian agrifood sector by the application of frontier technologies to high-potential industries.

Light Metals Flagship – To lead a global revolution in light metals, doubling export income and generating significant new industries for Australia by the 2020s while reducing environmental impact.

P-Health Flagship – 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.

Water for a Healthy Country Flagship – To achieve a tenfold increase in the economic, social and environmental benefits from water by 2025.

Wealth from Oceans Flagship – To position Australia by 2020 as an international benchmark in the delivery of economic, social and environmental wealth based on leadership in understanding ocean systems and processes.

Additional support from the Australian Government has facilitated the launch of three new Flagships:

Climate Adaptation Flagship – To significantly reduce the risks and costs for Australia associated with climate change adaptation.

Niche Manufacturing Flagship – To support the development of niche manufacturing businesses based on nanotechnology, worth in excess of $3 billion per year by 2020.

Minerals Down Under Flagship – To realise $1 trillion of new mineral resources and double the size of the related technology and services sector by 2020.

Broad Science Directions

A key part of CSIRO's approach to ensuring the relevance of its research is to periodically review the broad science directions of the Organisation. This provides the framework for our annual science investment cycle and ensures a balance between progressing longer term goals and delivering immediate benefits. The following section of the strategy outlines the science directions CSIRO will pursue during this strategic period.

The following headline broad science directions have been developed from a comprehensive review process commenced in 2005 and further refined during 2006:

- Continue to strengthen our world-class environmental research to provide practical solutions and options for the community, industry and policy makers, with particular emphasis on water supply and utilisation, and adapting to climate change
- Increase cross-organisational and cross-disciplinary integration and focus and ensuring more explicit and early consideration for the effective adoption of our science
- Build underpinning capability platforms in transformational biology, advanced materials, sensor network technologies and computational and simulation sciences
- Combine environmental sustainability expertise with research into agricultural productivity, leading to higher-value agricultural products
- Focus our research in health, including the relationship of food with nutrition and benefit of healthier lives for all Australians
- Continue our partnership contribution for developing solutions to broader national security and biosecurity issues
- Develop technologies to help provide Australia with a competitive edge in the global minerals market, as well as providing solutions for safer and more efficient mining, environmentally sustainable processing, and value-adding products
- Increase the intensity of our research into energy including exploration, production, electricity generation, distribution, end-use efficiency and greenhouse gas reduction and alternative transport fuels
- Further focus our efforts in renewable energy, by aligning our activities to those in which we have competitive advantage and where we can have significant impact
- Fully integrate our world-class ICT expertise with demand-driven community and industry areas
- Redirect elements of our physics, mathematics, biology, chemistry and engineering capabilities to grow our impact in the (niche) manufacturing domain
- Focus on next-generation radio astronomy through research leading to the successful implementation of the Square Kilometre Array initiative
- Increase research and development efforts to deliver enhanced services across industries in the economy
- More broadly and deeply integrate our capabilities in mathematics and computational science.

The broad science directions are to:

- Continue to strengthen our world-class environmental research to provide practical solutions and options for the community, industry and policy makers, in particular in water supply and utilisation and adapting to climate change
- Build capability platforms across the enterprise in transformational biology, advanced materials, sensor network technologies and computational and simulation sciences
- Increase the intensity of our research into energy including exploration, production, electricity generation, distribution, end use efficiency, greenhouse gas reduction and alternative transport fuels
- Increase the effectiveness of our efforts in renewable energy, by aligning our activities to those in which we have competitive advantage and where we can have significant impact
- Focus our health-related research on prevention, promotion and the links between food and nutrition
- Develop technologies to help provide Australia with a competitive edge in the global minerals market, as well as providing solutions for safer and more efficient mining, environmentally sustainable processing, and value-adding products
- Focus on next-generation radio astronomy leading to the successful implementation of the Square Kilometre Array initiative, in Australia
- Redirect elements of our physics, mathematics, biology, chemistry and engineering capabilities to grow our impact in the (niche) manufacturing domain
- Continue our partnership contribution for developing solutions to broader national security and biosecurity issues
- Integrate environmental sustainability expertise with world leading research in agricultural productivity as well as focussing on higher value agricultural products
- More broadly and deeply integrate our capabilities in information and communication technologies, mathematics and computational sciences






Our Outcome Domains

Overview

In our strategic plan to 2007, we focused our science in areas that would maximise our impact and relevance to Australian society. The 2011 strategic plan builds upon these areas of focus and also upon our recent achievements in science and in delivering science to Australian industry and communities.

We have therefore chosen for this strategic plan to demonstrate broad outcome domains that will be actively pursued in CSIRO over the next four years. These are all areas where CSIRO has a leading position nationally, where we expect to see new breakthroughs and discoveries in the coming years, and where we expect to deliver important and tangible benefits to Australian society.

Science Strategies

During the next four years CSIRO will focus on developing cross-cutting science strategies to respond to emerging areas such as the Bio-economy by drawing on the wide-ranging capability existing within, and also, outside the organisation relevant to bioscience. For example, based on our current state of biological knowledge we will develop a much deeper understanding of disease prevention (human, animals and plants), as well exploiting the planet's biological diversity for the production of novel and sustainable materials, products and processes which have the potential to transform traditional agriculture and create new industries.

Science Capability

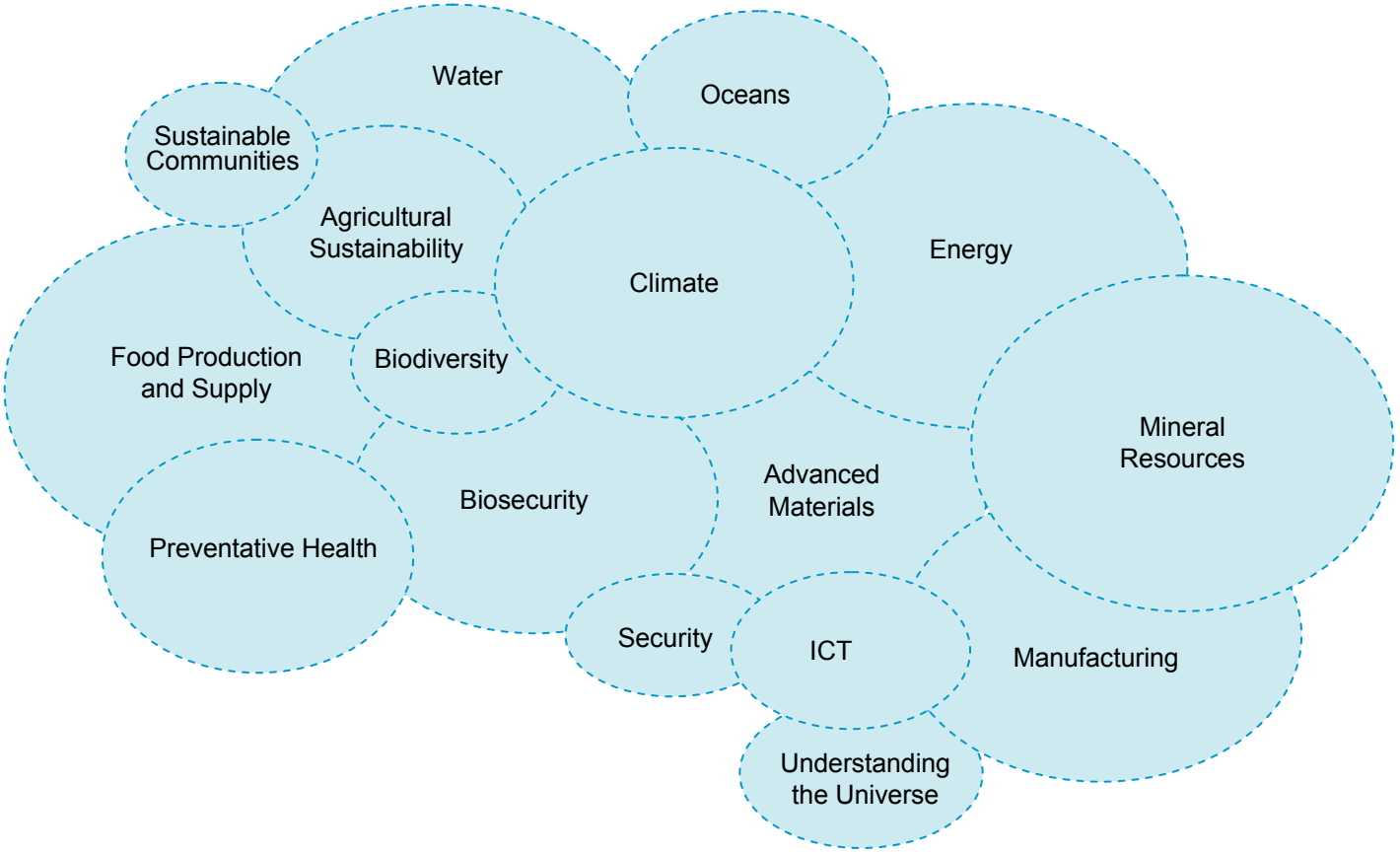
Most sustainable, paradigm-changing industrial progress is predicated on a world-leading science and technology base capable of developing and applying new approaches that allow new ideas to be converted into reality. Rapid and new developments in the biological and physical sciences underlying our industries are beginning to convert such dreams into economic reality. The challenge facing Australia is to select areas which are vital to our economy and society, and rapidly develop the next generation technology platforms that will enable us to retain our international standing, support competitive industries, continue to tackle national challenges such as water and energy, and attract top technical talent from overseas. If we move in the right direction but act too slowly, we will still be left behind.

By focusing on a number of domain areas, CSIRO will continue to develop, build and transform its core capabilities. We will dramatically increase our efforts in cross-organisational capability in domains such as transformational biology, sensor network technologies, advanced materials and computational and simulation sciences. In addition, we will continue to broaden and deepen our world-class ICT and mathematical capabilities in priority-outcome areas.

Our Strategy Delivers in a Number of Outcome Domains

CSIRO will continue to focus its science in delivering benefit to Australia

CSIRO's key outcomes domains are those areas where we will deliver concrete benefits for Australia and which are explained in more detail in the following pages. We will also continue to develop, build and transform our core capabilities for delivering these benefits. The diagram below provides an indication of our current focus and the connections across the areas. The size of the ellipses reflect approximate investment at this stage in this planning cycle.



Advanced Materials

New industries based on novel industrial materials and biomaterials from renewable resources.

Advanced materials are materials that acquire novel structures or superior properties, as a result of innovative synthesis, fabrication or processing techniques. These materials will be critical to the future advancement of society, particularly through their deployment to address global and national challenges in energy, water, climate change, health, ageing, resource-based industries, manufacturing, communications, food, agriculture, and environment.

There is considerable overlap between the areas of advanced materials and manufacturing; the latter refers to the production of transformed goods, usually requiring materials as inputs.

CSIRO is active in many areas of the advanced materials domain, for example:

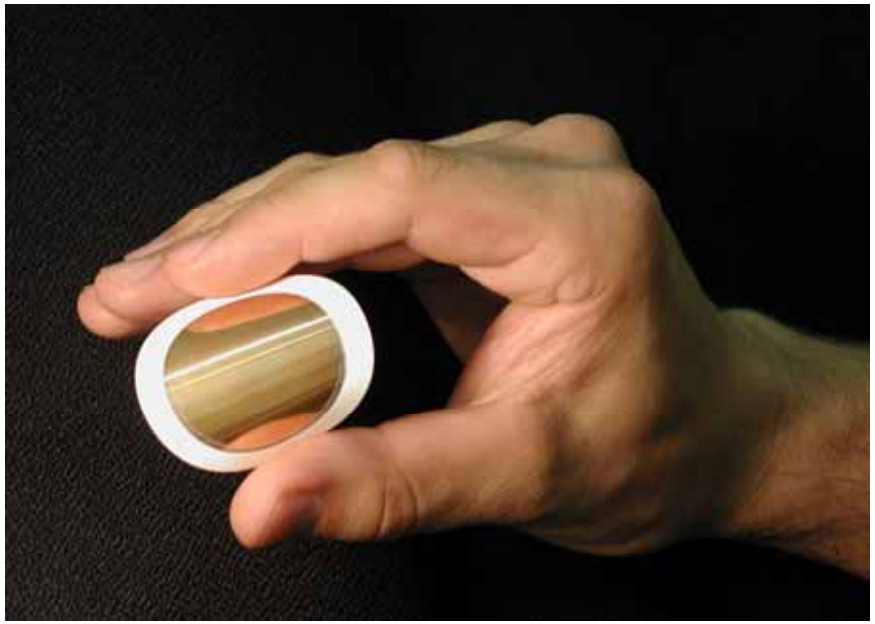
- the development of nanoscale materials, hierarchical materials possessing structure on multiple length scales, and materials that self-assemble to provide desired structures for end-applications
- the development of processes for titanium extraction and use
- the utilisation of natural fibres such as wool, cotton and timber and polymer and carbon nanotube synthetic fibres
- the development of bio-inspired, bio-mimetic and bio-based materials.

In general, the advanced materials domain is concerned with the development of performance-enhancing materials. All of the developments strongly underpin opportunities for Australia to develop unique, globally-competitive industries as a means of maintaining its position as a sophisticated manufacturing nation.

As an outcome-oriented research domain, advanced materials therefore provides the impetus to consider and focus CSIRO's capability in materials science and engineering in a systematic and holistic way, bringing together the chemical, physical and biological sciences with the allied domains of design, manufacturing/fabrication and systems integration. The converging domain of advanced materials integrates CSIRO's existing strong capabilities in both traditional organic and inorganic materials development with more recent developments in nanotechnology and biotechnology.

Advanced Materials

- Human civilisation and technological progress is dependent on our ability to adapt to environments and use materials for tools and equipment, shelter and clothing, food production, energy storage and supply, transport, and health-related wellbeing
- In an age where natural materials are becoming scarce, science and technology provide the means for transforming and enhancing existing materials, as well as for developing entirely new materials
- CSIRO is active in the advanced materials domain – combining CSIRO's traditional capabilities in organic and inorganic materials design, creation, characterisation and application, with more recent developments in nanotechnology and biotechnology



Aims and directions for the next 4-5 years

- Integrate and focus CSIRO's substantial advanced materials science and engineering capability to deliver materials which can be incorporated in new or existing products to generate products with a clear performance edge and/or improved cost structure
- Employ advanced materials and associated products to address national challenges in energy, water, climate change, health, ageing, resource-based industries, manufacturing, communications, food, agriculture, and the environment
- Key developments will be: nanostructured materials, light metals and metal alloys, biomaterials, natural and synthetic fibre-based materials, bio-derived materials, polymeric materials, hierarchical materials, self-assembly materials, self-healing materials, novel fit-for-function materials, and greater understanding of the health, environmental and safety aspects of novel materials

Agricultural Sustainability

A greener agricultural industry with increased longer term economic benefit.

CSIRO is endeavouring to increase the total economic value to Australia from agricultural landscapes. It aims to do this by reducing the ecological footprint of Australian agriculture and increasing the resilience of rural and regional communities by equipping them with knowledge, planning processes and policy options.

Agricultural production in Australia has become increasingly affected by four sets of drivers, which are impacting on the long-term viability of the industry:

- increasing economic globalisation and competition in world commodity markets
- scrutiny of Australian produce in domestic and major markets in the developed world
- competing alternative demands for environmental resources and services
- increasing evidence for widespread climate change.

These drivers represent a range of economic, environmental and social issues which together establish a triple-bottom line for sustainable agricultural production. This complex combination of drivers means that Australia can no longer rely on traditional approaches of increasing productivity to ensure on-going economic viability. However, through effective intermeshing of agricultural production and environmental resource use, these factors offer major opportunities to position Australia as a preferred supplier of premium, higher-value agricultural products.

CSIRO is the only provider capable of bringing together large multi-skilled and diverse teams to tackle the combined economic, environmental and social planks that together constitute the true nature of agricultural sustainability. However, it is also well recognised that CSIRO is not the only research provider. For this reason our integrated teams work with and develop enduring partnerships with a range of existing research providers, funders and users.

CSIRO's major goals in this area for the next five years are to:

- increase the total economic value to Australia from agricultural landscapes by increasing agricultural unit productivity and quality under conditions of risk and uncertainty, and facilitating industry diversification, differentiation and value adding of commodities
- reduce the ecological footprint of Australian agriculture through assessment and valuing of key biodiversity processes that provide critical ecosystem services
- increase the resilience of rural and regional communities by equipping them with knowledge, planning processes and policy options and by enhancing rural enterprises' ability to anticipate and adapt to local, regional and global climate change.

Agricultural Sustainability

- Agriculture manages the majority of the Australian land surface, underpins many rural and regional communities and contributes significantly to economic activity and export income, all of which require innovative and transformational solutions for sustainable industries
- CSIRO combines the skills in agricultural, environmental, economic and social sciences needed to address sustainability challenges facing Australian agriculture
- CSIRO is strengthening its internal integration and external partnerships to better support sustainability in cropping, grazing, horticulture and forestry enterprises

Aims and directions for the next 4-5 years

- Facilitate industry diversification, differentiation and value adding of commodities for increased productivity and economic value to Australia
- Reduce the ecological footprint of Australian agriculture
- Enhance the resilience of rural and regional communities

Biodiversity

The value of Australia's biodiversity is understood and its future secured.

Biodiversity is Australia's life support system. CSIRO's vision is to provide Australians with the means to use biodiversity for our long-term economic, environmental and social wellbeing in the face of significant global change – caused by increased human population and per capita resource use.

Global change to biodiversity is driven by three primary threats: loss of habitat and decline in ecosystem function and services; spread of invasive pests, weeds and diseases; and, climate change impacts. In addressing these threats, CSIRO's current activities focus on:

- knowing what biodiversity we have and making this information available electronically through our national collections
- evaluating and managing drivers of change
- understanding consequences of change in complex ecological systems
- conserving and using our biodiversity.

Various services that flow from improved understanding and management of Australia's biodiversity and its ecosystem functions include:

- sustainable management of key conservation areas
- sustained livelihoods for agriculture, forestry and fisheries, and tourism
- effective restoration of native ecosystems on natural, managed and urban landscapes
- improved processing of agricultural and urban waste for nutrient recycling, reducing dryland salinity, water purification and production of biofuels
- improved human and livestock health
- regulation of vector-borne human and animal diseases
- the development of new industries in the areas of food, fibre and pharmaceuticals utilizing novel compounds of biological origin.

CSIRO is taking the lead in describing, conserving and using our biodiversity for national benefit. The focus of our national leadership over the next five years is in:

- working with external collaborators to build an *Atlas of Living Australia* that provides an accessible and reliable focus for Australia's knowledge of its biota through comprehensive, national, biological reference collections
- developing eco-genomics by applying tools and methodologies to valuable but relatively poorly known biodiverse groups that play integral roles in key ecosystem processes
- utilising genomics tools to develop novel sources of biomaterials
- building a quantitative body of knowledge on the value of ecosystem services that the biota provides
- developing response options that meet our increasing demands for water, food, fuel, fibre and waste disposal whilst meeting simultaneous targets to reduce biodiversity loss.

Biodiversity

- Over the past 50 years humans have changed ecosystems more rapidly and extensively than in any comparable time in human history. The result has been a substantial loss in the diversity of life, which is critical to long-term economic, environmental and social wellbeing
- CSIRO is taking the lead in describing, conserving and using our biodiversity for national benefit
- CSIRO is developing information systems to understand the consequences of change in biodiversity in response to habitat loss, the spread of invasive species, and climate change

Aims and directions for the next 4-5 years

- Build an *Atlas of Living Australia* – a real-time web-based taxonomy and collection system – that is an accessible and reliable source of knowledge on Australia's biota
- Better predict ecosystem processes, for the management of biodiversity and ecosystem services
- Provide accurate and relevant scientific advice for local, regional and national policy development
- Integrate scientific disciplines to develop novel products from Australian biodiversity

Biosecurity

An Australia safe from emerging and future biological threats.

In a connected world, Australian biota and ecosystem services are vulnerable. Invasive species are now among the top three threats to our natural ecosystems – with rising economic, environmental and social consequences. Imported weeds now cost Australian agriculture $4 billion per annum. A single outbreak of foot and mouth disease would cost Australia $9 billion per annum over 8 years.

As the key national provider of underpinning science to reduce the impact of biological invaders and to manage the risk of emerging and future threats, CSIRO works to:

- build preparedness – develop information systems, and decision support systems for emerging biological threats
- prevent the emergence of new threats – devise risk assessment tools and pre-emptive strategies to prevent the establishment of new invaders, and carry out research to deconstruct the pathways in the invasion process
- tackle existing national priority invaders – develop transformational systems-based approaches for reducing the impact of national priority invaders
- build national research and development capacity all along the quarantine continuum, against all biological threats – through building networks of researchers across the nation collaborating to deliver to the national AusBIOSEC outcomes.

CSIRO's ambitious goals over the next five years are:

- foster the development of national Biosecurity research and development capacity along the quarantine continuum, through national research networks collaborating to deliver to AusBIOSEC outcomes
- build platforms for collaboration with policy makers to devise a world-leading biosecurity system
- apply risk analysis, bio-economic analysis, modelling and geographic information system capability to prevent the establishment and spread of new invaders and future threats
- develop the information systems for prioritising emerging biological threats under climate change
- develop novel systems-based approaches for mitigating the impacts of national priority invaders
- establish a system to govern access for national researchers to the Australian Animal Health Laboratory under the National Collaborative Research Infrastructure Strategy.

Biosecurity

- In a connected, modern world, Australia faces critical and costly threats from invasive species
- CSIRO is the key national provider of science to help Australia reduce the impact of biological invaders and to manage the risk of emerging and future threats
- CSIRO develops tools to prioritise and prepare for emerging threats as well as preventing the emergence of threats
- CSIRO applies high-tech systems to tackle existing invaders backed up by critical infrastructure – such as the Australian Animal Health Laboratory

Aims and directions for the next 4-5 years

- Foster the development of biosecurity research and development capacity for national quarantine to deliver against the national AusBIOSEC outcomes
- Build national platforms for collaboration with policy makers to devise a world-leading biosecurity system
- Develop novel approaches for preventing the establishment, spread and impact of biological threats
- National access for all researchers to access the Australian Animal Health Laboratory under the National Collaborative Research Infrastructure Strategy initiative

Climate

Practical solutions to help Australia adapt to climate change.

Australia is vulnerable to climate change economically, socially, and environmentally. As a consequence of climate change, we face limits on water resources, increased risk of infrastructure damage by severe weather, chronic drought and social instability in regional communities, and pressures on iconic ecosystems such as the Great Barrier Reef and the Australian Alps.

The response has to be waged on two fronts: first, through efforts to reduce greenhouse emissions; and second, by developing strategies to adapt to the changes that are now unavoidably underway. CSIRO is uniquely placed within the National Innovation System to lead in the development of integrated mitigation and adaptation solutions and will do this through the new Climate Adaptation Flagship. Building from an internationally recognised platform of science excellence and a track-record of delivery, our strategy is to create the base for informed adaptation to climate change by integrating science with policy needs at regional and national scales.

CSIRO will do this by:

- transforming climate science through a partnership with the Bureau of Meteorology – a Joint Centre for Atmospheric and Earth Systems Science
- leading national capability in earth system science via development of the Australian Community Climate and Earth System Simulator (ACCESS) with the Bureau of Meteorology and Universities, and investing in high performance supercomputing with the Bureau of Meteorology
- gaining leverage from related transformative observational technologies – ACCESS integrated with the new Integrated Marine Observing System, Water Resources Observation Network, and Terrestrial Ecosystems Research Network – in partnership with many others
- partnering for impact with policy makers, industry, the community and other researchers, to ensure that our products lead to cogent, effective and applicable options for adaptation.

Over the next five years, CSIRO's strategic goals for projecting future climate change and its impacts, and for developing useful adaptive responses are to:

- continue to develop the techniques and knowledge to monitor, observe and understand the interaction of land, marine and atmospheric processes and the role these interactions play in Australia's environment
- lead the Australian science community in the development of a world-competitive coupled climate and earth system simulator and associated infrastructure in order to improve weather and pollution prediction systems and to deliver new knowledge and applications to policy-makers and decision-makers in climate-sensitive industries.

Climate

- Australia faces an urgent challenge in adapting to global and regional climate change, especially since global warming is accelerating
- CSIRO is a leading contributor to the development of new technologies for detecting, understanding and attributing impacts of climate change: Integrated Marine Observing System, Water Resources Observation Network, and Terrestrial Ecosystems Research Network
- CSIRO is leading a national effort in developing world-competitive earth system science – the **A**ustralian **C**ommunity **C**limate and **E**arth **S**ystem **S**imulator with the Bureau of Meteorology – to underpin risk management and adaptation strategies

Aims and directions for the next 4-5 years

- Better monitor, observe and understand the interactions between human activity and land, marine and atmospheric processes so that 'knock-on' effects of climate change to Australia's economy and social systems are clearly characterised and managed
- Lead the Australian science community in the field of weather, climate and environmental prediction via a world-leading climate and earth system simulator and applications
- In partnership with government, industries and communities, create new knowledge and deliver applications for effective climate adaptation regionally and nationally
- Provide national technical capability and capacity for successful execution of the national and State climate adaptation frameworks

Energy

New technologies for the clean and secure production of energy from fossil fuels and renewable sources.

A key international competitive advantage for Australia derives from its unique endowment in energy resources. These contribute substantially to the national standard of living and provide a platform from which Australia can become a leading energy and technology supplier to the Asia-Pacific region.

CSIRO's aspiration is to create a secure, clean and cost-effective Australian and regional energy supply founded on Australia's competitive resources and technology leadership. Through the work of CSIRO and its partners, Australia is already transforming its unique energy endowment, and becoming a global supplier of energy and a global leader in energy technologies. To provide maximum benefit to Australia, CSIRO will focus on three critical and interlinked objectives in its energy research: delivering cleaner energy, enhancing energy security, and wealth creation.

Consequently, over the period to 2011, CSIRO will be involved in a wide range of research, development and demonstration activities including research relating to fossil fuel technologies, renewable energy technologies for the production of electricity and hydrogen, technologies for energy distribution, management and security of supply, and transport technologies.

CSIRO's major aims for the next five years include:

- developing and demonstrating near-zero emissions technologies for power generation from coal and natural gas
- developing solar technologies for low emissions power generation and production of hydrogen
- improving technologies for conversion of coal, natural gas and biomass to transport fuels
- enhancing technologies for energy storage, end-use efficiency, and distributed energy management and control
- to provide Australian coal exploration and mining with the most advanced mining system technologies
- increasing the success rate in identifying new hydrocarbon resources including offshore and onshore frontier basins
- introducing key technologies that can eliminate offshore gas production platforms and significantly enhance oil and gas recovery from reservoirs.

Energy

- Australia faces critical issues for reducing our greenhouse gas emissions, ensuring energy security (especially related to liquid fuels) and creating wealth from energy
- CSIRO's energy research portfolio recognises a level of dependence on fossil fuels but envisages a future with secure, clean and cost effective energy for Australia
- Australia has the opportunity to become a global technology leader in low emission fossil fuel technologies
- CSIRO has major commitments in energy research and development – under the Energy Transformed and the Wealth from Oceans Flagships and in the Divisions of Energy Technology and Petroleum Resources

Aims and directions for the next 4-5 years

- Develop coal, gas and solar technologies and demonstrators for low emissions and near zero emissions
- Develop new technologies for converting coal, gas and biomass to transport fuels, and technologies for energy storage, end-use efficiency and distributed energy management and control
- Increase success rates in identifying new hydrocarbon resources, and to introduce technologies to enhance oil and gas recovery from reservoirs

Food Production and Supply

Growing food exports as well as increased production of healthier and safer foods.

The consumer drivers of health and wellbeing combined with the growth of fresh, natural, minimally processed and convenient foods present Australia with an important challenge and a significant opportunity.

The food and beverage sector is a major component of Australian manufacturing and retail industries with a forecast value in excess of $125 billion in 2006/07. Food retailing is growing on average by 6.1% per annum, and the food service sector is growing at 7.6% per annum. Exports of processed food have grown by around 10% per annum over the last years. Food imports have grown by around 7.7% per annum annually over the last nine year period. The total value of food exports in 2004/05 was $20.8 billion (meat, field crop, wine, dairy, horticulture and seafood sectors). Yet in terms of commodities in the export domain, Australia is facing a long-term decline particularly in the price of its grain.

A significant opportunity therefore exists to value-add to commodities (such as grain and beef) that can provide improvements in food quality and/or health benefit to consumers.

CSIRO is well positioned to integrate the disciplines necessary to catalyse the change required to ensure Australia's future position as a leader in the food value chain. It seeks to do this by developing healthy foods, innovative processing technologies, improving food satisfaction and choice and contributing to a safe and secure supply chain.

Alignment of the activities of CSIRO Divisions responsible for food production with consumer and market demand is occurring through strong industry links, and increasingly through integration of the scientific disciplines between Food Science Australia, Livestock Industries, Marine and Atmospheric Research and Plant Industry in the Food Futures and Preventative Health Flagships. This integration is also seeing increasing alignment with goals of the Preventative Health Flagship.

CSIRO aspires to improve the competitiveness of the Australian food sector and its contribution to the nutritional status, health and wellbeing of the Australian population through the application of transformational science and technology.

By working in this integrated way, over the next five years, CSIRO aims to develop:

- improved plant and animal products with differentiating attributes in quality, health and consumer appeal through the application of advanced genetics
- improved plant and animal products through the application of advanced breeding technologies
- an ability to sense (biologically) active compounds and quantify these – such as, to develop objective rather than subjective measures of flavour
- increased value added to raw materials, by-products and 'waste' products.

Food Production and Supply

- There are significant opportunities to enhance Australia's food production systems, through an integrated farm-to-fork approach, as consumers shift to fresh, natural, minimally processed and convenient foods promoting health and wellbeing
- CSIRO's science is based on the activities of the Food Futures and Preventative Health Flagships as well as the Divisions of Food Science Australia, Livestock Industries and Marine and Atmospheric Research and Plant Industry
- CSIRO is integrating leading scientific disciplines to underpin Australian food industry innovation: combining nutrition with genomics, introducing advanced materials into packaging, and linking knowledge about food structure with processing and distribution technologies

Aims and directions for the next 4-5 years

- Develop improved and value-added plant and animal products and processes with quality, health and consumer appeal
- Develop novel sensing technologies for objectively measuring compounds such as flavour
- Add value to raw materials, by-products, and 'waste' products

Information and Communication Technologies

World leading ICT for products and services to underpin industrial competitiveness.

The service sector is a major contributor to Australia's GDP and a source of employment, investment and export revenue. Embedded services are estimated to account for 20% of the value of exported goods. For 20 years the service sector has grown faster than any other sector.

A key component of the productivity gains and growth in Services comes from the smarter collection, management and use of information.

The use of new Information and Communication technologies has led to large productivity improvements and is creating opportunities for a vast array of new products and services.

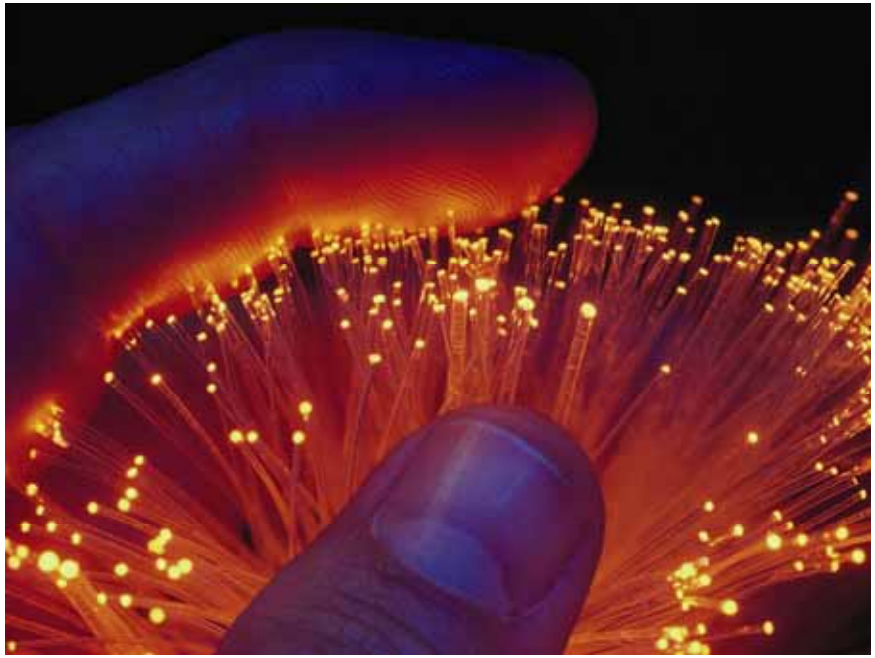
When linked to mathematics-based technologies they enable the simplification and automation of knowledge-based services and the better use of models and data to inform decisions and manage systems optimally.

Drivers for change and growth in services include the:

- revolution in electronics and communication technologies enabling fast and cheap communication to anywhere in the world and the automatic generation and collection of data
- development of standards for interfaces between stages in manufacturing and service processes and the pressure for efficiencies and specialisation leading to outsourcing
- opportunity to exploit large volumes of information from multiple sources provided they can be synthesised and simplified
- globalisation – the reduction of barriers (physical, cultural and regulatory) to remote performance and delivery of services and components of services – creating opportunities for exports and threats of imports
- demand for new entertainment sources and the incorporation of new technologies into media
- service organisations generally innovate incrementally and are successful if their offerings are well directed to meet customer needs. Services firms traditionally have had no formal research function. The implications are that for success we need to develop technology that is flexible enough to be adapted to the needs of a range of customers; and work very closely with a commercial service provider and end users to ensure a focus on real needs
- services organisations tend to innovate within industries, yet the innovative technologies for services cut across industries and we need to find ways of spreading advances from the leading innovators to others. For example, adapting technologies developed in the finance sector for assessing risk and applying them in the health sector.

Information and Communication Technologies

- Information, communication and mathematical technologies create opportunities for new products and services and enhance our overall productivity. The technologies help us to collect, manage and use information
- CSIRO is applying a more integrated approach for the support of services both as components of other industries such as Mining or Environment and across sectors itself such as in Finance and Insurance, Transport and Storage, Health and Community Services and Communications supply chain management
- CSIRO has a number of world-class capabilities in these areas and is focused on developing technologies and systems that are relevant to Australia and are globally competitive



Aims and directions for the next 4-5 years

- Develop breakthrough wireless communications and sensor network technologies
- To develop autonomous systems and dependable and reliable robotics technologies for application in Australia's resources and primary industries
- Develop quantitative methodologies to assess the vast volumes of measurements in biological systems
- Develop information search, retrieval, delivery and analysis technologies for the services industry
- Develop technologies that enable creation and effective delivery of new, globally deliverable services
- Develop advanced network infrastructure and applications to support the nation's research environment

Manufacturing

Niche products and new Australia companies for a globally competitive manufacturing industry.

After property and business services, the manufacturing sector remains the second largest sector of the Australian economy, currently accounting for around 13% of annual value-added activity. Annual manufacturing sales are broadly estimated to be around $290 billion a year. However, the sector's share of the economy has fallen from 15% a decade ago. The sector faces challenges from increasing global competition, global sourcing and supply chains and increasing technical complexity in manufacturing.

CSIRO seeks to partner with the manufacturing sector to keep it globally competitive through the implementation of technology and innovation. Whilst the manufacturing sector is very broad CSIRO has a particular focus in light metals, biomedical, and electronics; and across the textile, industrial machinery, fine chemicals, and scientific and instrumentation industries

High-level goals in this area are to increase manufacturing industry turnover, to generate and grow a number of new Small to Medium Enterprises (in conjunction with the new Niche Manufacturing Flagship), and to grow export revenue from manufacturing.

Over the next five years, CSIRO aims to:

- develop fabricated devices and products, based on innovative material science and system integration, that allow competitive Australian manufacturing
- develop technologies that reduce costs for a competitive manufacturing industry
- focus on expanding CSIRO's role as a 'global portal' for Australian manufacturers, particularly innovative Small and Medium Enterprises, by delivering global technologies tailored to Australian conditions and opportunities
- develop specific technologies which underpin globally competitive Australian titanium industry.

Manufacturing

- Manufacturing remains one of the largest sectors of the Australian economy, currently accounting for around 13% of GDP. But the sector faces many challenges including increasing international competition, global sourcing and supply chains, and increasing technical complexity
- CSIRO has a large number of on-going partnerships with the Australian manufacturing sector geared to keep it globally competitive by tackling the industry's increasingly sophisticated and technically complicated market place
- CSIRO's particular focus is in light metals, biomedical, electronics, and the textile, industrial machinery, fine chemicals and scientific and instrumentation industries

Aims and directions for the next 4-5 years

- Develop technologies that reduce costs for a competitive manufacturing industry and which underpin specific industries such as the Australian titanium industry
- Focus on expanding CSIRO role as a 'global portal' for Australian manufacturers, particularly innovative Small to Medium Enterprises, by delivering global technologies tailored for Australia

Mineral Resources

Australia's competitive edge in the global minerals market is significantly enhanced, as a result of new technologies for exploration, processing and light metals production.

For 50 years, Australia has had a significant advantage in the competition for investment in its minerals industry. This advantage was based on huge, high-quality resources discovered and developed after World War II. As a result, the minerals industry today has:

- added more than $500 billion in export earnings and expenditure to Australia's wealth in the last 20 years
- contributes five times more value to GDP per person employed than any other sector
- accounts for 19% of Australia's fixed assets and natural capital
- contributed over $90 billion to the balance of trade in 2005/06
- provided over $4 billion per year in taxes and royalties
- contributes a further $4 billion in mining technology and service sales, which are global and expected to grow to as much as $8 billion in the next five to six years.

CSIRO's involvement in this critically important sector includes research, development and technology transfer activities that cover: the search for mineralisation in or on the earth's crust; the safe and efficient mining of mineral deposits; the cost-effective and environmentally sustainable processing of these resources; and aspects of down-stream value adding through the Light Metals Flagship, which has a vision to make Australia the world leader in sustainable light metals production and manufacture. Through its Minerals Down Under Flagship, CSIRO also develops technologies to ensure that Australia's comparative advantage in minerals continues to provide a competitive edge in a global mineral market in the medium to long-term.

Over the next five years, CSIRO's work in this area has a number of goals to:

- grow Australia's resource base significantly by developing technologies (together with state geological surveys) that reduce exploration risk, encourage renewed investment and generate major discoveries beneath Australia's vast covered terrains
- position Australian mining with the most advanced international mining system technologies – in automation, sensing, data fusion, visualisation and adaptive control – impacting directly on the safety, reliability and productivity of the world's future mines.
- maximise the value of Australian bulk mineral commodities, by ensuring the ongoing world leading competitiveness of Australian minerals processing, and to upgrade Australia's vast quantities of low-grade and complex ores
- create a world-scale integrated light metals industry, double the revenue from light metals production to A$20 billion per annum, develop superior, cost-effective manufacturing systems, develop technology for a new magnesium and titanium industry, and reduce energy use, greenhouse emissions and environmental impact.

Mineral Resources

- The minerals industry has added more than $500 billion to Australia's wealth in the last 20 years and contributes five times more value to GDP per person employed than any other sector
- CSIRO integrates today's most advanced technologies for next-generation tools and solutions for safer and more efficient mining, environmentally sustainable processing, and value-adding of mineral products
- The Light Metals and Minerals Down Under Flagships seek to help make Australia the world leader in large-scale sustainable light metals production whilst also realising significantly more new resources

Aims and directions for the next 4-5 years

- Develop advanced technologies for reduced exploration risk and renewed investment to grow Australia's current known resource base
- Provide the most advanced international mining system technologies in automation, electronics, data fusion, sensing and visualisation
- Maximise the value of Australian mineral commodities and metals with new sustainable processing technologies and strategies to substantially improve low-grade and complex ores

Oceans

Sustainable access to the vast economic and social wealth of our oceans, whilst preserving their environmental value.

Australia has the third largest ocean territory in the world, extending from our vast coastline to the edges of our Exclusive Economic Zone. Some 70% of Australia's national estate is ocean territory, though it remains quite poorly understood and relatively undeveloped. Yet even in this emergent state, our oceans contribute significantly to the national economy and most Australians live near the coast, regularly interacting with the ocean.

As a nation, we have an opportunity to derive significant economic and social benefit from our oceans while sustaining their ecological value for future generations, and avoiding many of the expensive mistakes already made in terrestrial systems. CSIRO's goal is to realise this opportunity for Australia. As an organisation, CSIRO has the scientific capacity to massively increase understanding of our oceans. CSIRO also has the relationships with governments, industries and communities that will enable use of this increased understanding to reduce uncertainty and maximise opportunity.

Oceans

- Australia has the third largest ocean territory in the world. Some 70% of Australia's national estate is ocean territory, although it remains poorly understood and relatively undeveloped
- CSIRO has leading expertise in fisheries and marine ecosystems management, marine conservation and biodiversity planning and management, ocean prediction systems, and regional marine development
- In partnership with the Australian Government and other research providers, CSIRO is investing in significant marine research infrastructure

Aims and directions for the next 4-5 years

- Provide the science to transform Australia's fisheries into an economically and ecologically sustainable industry
- Provide the multidisciplinary scientific understanding to underpin conservation of Australia's marine biodiversity in Commonwealth and State waters
- Enable the sustainable multiple-use development of Australia's coastal and marine regions through widespread adoption of science-based information and tools

Preventative Health

Improved health and wellbeing of Australians through better prevention, early detection and intervention.

There are three major drivers for CSIRO's work in health:

- Australia's total expenditure on health is growing by an average of 5.5% per year
- Australia has an ageing population with a flow-through downward impact on participation rates
- Australia is now ranked as one of the fattest nations in the world with a corresponding deterioration of health status.

CSIRO's capabilities fall into three major categories: food and nutrition; molecular and ICT and statistical-modelling capabilities (including chemistry, polymer chemistry, biochemistry, molecular and cellular biology, structural biology, genomics, proteomics, epigenomics, ICT health informatics). These capabilities are integrated into multidisciplinary teams as part of the Preventative Health and Food Futures Flagships and as part of Divisional themes tackling national health challenges.

Major areas of focus are nutrition, biocompatible materials and regenerative medicine; obesity and related diseases such as diabetes; cardiovascular disease; colorectal cancer and gut health; other forms of cancer prevalent in the Australian population (lung and prostate); and neurodegenerative diseases including Alzheimer's disease.

To have a significant impact on the health of Australians – by applying our skills in food, nutrition, molecular and ICT technologies and with a focus on preventative approaches and through collaboration with key partners – over the next five years CSIRO aims to:

- target obesity, colorectal cancer, other specific forms of cancer (e.g. lung and prostate); the impact of an ageing population and Alzheimer's disease
- develop novel nanoscale materials for new bioactive delivery technologies
- develop improved diagnostic and imaging technologies
- develop and apply novel biodegradable and bioactive materials for repair, replacement and regeneration
- provide better information, improve quality of healthcare, address health workforce constraints and reduce healthcare costs.

Preventative Health

- Australia has an ageing population contributing to reduced participation and high costs for related chronic diseases
- The Australian population is also now ranked one of the fattest on the globe with an increasing risk of obesity related diseases
- CSIRO, through its Preventative Health and Food Futures Flagships and Divisions, is tackling major national health challenges in regenerative medicine and the development of biocompatible materials obesity and related diseases (such as diabetes and cardiovascular disease) colorectal cancer and gut health other forms of cancer prevalent in the Australian population (lung and prostate) and neurodegenerative diseases such as Alzheimer's disease

Aims and directions for the next 4-5 years

- Progress our 2020 science objectives for reducing the burden of: obesity, colorectal and other forms of cancer, the impact of an ageing Australian population and for delaying the onset of Alzheimer's disease in Australia
- Develop new technologies for bioactives and their delivery; improved diagnostic and imaging technologies; new biodegradable and bioactive materials for repair, replacement and regeneration; and harnessing strengths in the food chain and nutrition
- Provide better information to improve the safety and quality of health care, address health workforce constraints, and reduce health care costs

Security

A safer and more secure society.

Terrorism represents a major new security threat to Australia with unique implications. We have a linear infrastructure belt from Brisbane to Adelaide, whereas other developed countries have much more clustered and networked systems; and our isolation and vast un-patrolled border remain key aspects of potentially unique vulnerability. To face these challenges, CSIRO is participating in a national, networked, knowledge-based approach to the development of security technologies to protect critical infrastructure against chemical, biological, radiological, nuclear and explosives attacks, and prevent the emergence of new threats. The outcomes will be a safer society for the Australian people, our industry, and our environment, through science and technology.

Security

- Australia is uniquely vulnerable to security and terrorist threats because of its linear infrastructure and vast borders
- CSIRO has developed world-first security technologies – such as non-invasive scanning of airport cargo. CSIRO has also developed important modeling tools – such as the Critical Infrastructure Protection Modelling and Analysis Program developed with the Attorney-General's Department
- CSIRO is now working with other publicly funded agencies to meet priorities in physical and information security, water and air contamination, critical infrastructure protection, and threat risk assessment

Aims and directions for the next 4-5 years

- Form a new national security research partnership with industry, the Defence Science and Technology Organisation, the Australian Nuclear Scientific and Technology Organisation, Geoscience Australia, State and Federal agencies
- Establish a national science and technology program in security technologies under the Department of Prime Minister and Cabinet
- Deploy technologies in chemical, biological, radiological and nuclear threat, border and local surveillance and intrusion detection, water and air contamination, threat risk methodology to detect terrorist and bio-security incidents

Sustainable Communities

Prosperous communities through sustainable and wealth-creating use of natural, built and human resources.

Australia's cities and urban and regional communities face a number of critical vulnerabilities such as:

- inadequate and ageing water and energy infrastructure
- rapid growth in ecological and culturally important 'sea-change and tree-change' regions
- unsustainable behaviour and attitudes towards consumption of resources
- comparative declines in quality of life in remote communities
- negative social and health impacts of urbanisation (increasing commute times, rising obesity and overweight levels associated with a lack of urban design for human health and wellbeing).

The Sustainable Communities science area provides Australian governments, industry and community with knowledge on urban systems, regional and community resource dynamics and sustainability pathways and targets at scales ranging from the individual building to the development precinct, the city region and to remote indigenous communities.

This research will result in more efficient resource use, more effective planning and management of resource use systems, improved environmental quality, enhanced human health and wellbeing through more effective resource use planning and design and governance.

The cluster has significant goals over the next five years:

- develop real-time assessments of water, energy, material use, biodiversity, bushfire and human health impacts
- establish two national technology transfer portals, 'Your Building' and 'Your Development', a joint Australian Greenhouse Office-CSIRO initiative
- develop culturally appropriate options with Indigenous communities for participation in regional economies and maintain landscape health
- design regionally-appropriate planning systems to enable business, community and governments to achieve collective goals
- develop evidence-based decision-making in natural resource investment and policy decisions at local, regional and national scales
- model the metabolism of future urban regions involving integrated urban water, renewable energy, sustainable materials and more compact urban forms
- establish design principles for healthy human habitat in urban and regional environments
- complete multiple case study projects through the Sustainable Communities Initiative (public, private and research sectors working with regions and communities).

Sustainable Communities

- Australia's communities in cities, rural areas and remote regions currently face a number of critical vulnerabilities: ageing and inadequate physical infrastructure, unsustainable resource consumption rates, and negative social and health impacts from rapid urbanisation
- CSIRO is Australia's main independent source of knowledge to support the implementation of national policies for urban and regional sustainability
- CSIRO provides scientific information to Australian governments, industry and the community on resource use, urban planning and design, natural resource management, improved environmental quality of cities and enhanced human health

Aims and directions for the next 4-5 years

- Develop of internet knowledge portals to underpin innovation diffusion for high-performance buildings (*Your Building*) and urban development projects (*Your Development*)
- Systems and tools for more sustainable resource use in Australia's urban and regional landscapes with a focus on integrated planning and management of water, energy, material use, biodiversity, bushfire risk, and human health
- Build national capacity for evidence-based sustainability transitions from localised to regional scales based on a diverse portfolio of case-study activities (eg. through the 'Sustainable Communities initiative')

Understanding the Universe

World leading astronomy with increased investment in Australia.

CSIRO operates a world-class National Facility for radio astronomy for the Australian and international astronomical community, supported by leading-edge technical innovation and high-quality astrophysical research. CSIRO's facility includes the highest impact radio telescope in the world as measured by citations per paper, and the second most productive as measured by publications.

Astronomy is amongst Australia's highest performing areas of research, as measured by international citations. CSIRO's radio astronomy research has global impact and helps maintain the world-class standard of CSIRO's scientists and Australian science.

Over the next five years, the cluster will contribute answers to key science questions of 21st century astrophysics and physics, including the formation of the first stars in the Universe, the origin of cosmic magnetism, the nature of dark energy and the most stringent tests of general relativity. It will do so through the following infrastructure programs that will:

- improve the performance of the Australia Telescope Compact Array by completing technical upgrades which will deliver unprecedented broadband capability in cm and mm-wave astronomy and further enhance its international competitiveness
- enhance the capability of the Parkes radio telescope, including its use as a test-bed to develop and exploit innovative phased-array feed technology
- build and begin operating a major new radio telescope incorporating the groundbreaking new technologies required for the Square Kilometre Array, together with key international partners including Canada, US, Europe, South Africa, India and China.

Through these activities, the cluster will consolidate Australia's role in the SKA project, influencing key site and technology decisions towards the end of the decade. It will position Australia to obtain the maximum scientific, technological and societal benefits from its involvement in this global 21st century mega-science project.

Understanding the Universe

- CSIRO operates 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
- CSIRO operates the highest impact radio telescope in the world as measured by citations/paper and the second most productive as measured by publications
- Australia is uniquely positioned to take a leading role in the development and siting of the next generation of international radio telescopes, including the Square Kilometre Array

Aims and directions for the next 4-5 years

- Address key science questions of 21st century astrophysics and physics, including the formation of the first stars in the Universe, the origin of cosmic magnetism, the nature of dark energy and the most stringent tests of general relativity
- Enhance the international competitiveness of existing facilities – particularly the Australia Telescope Compact Array and the Parkes radio telescope
- Build and operate a major 'pathfinder' instrument for the international Square Kilometre Array project, enhancing Australia's leadership role in next generation radio astronomy facilities

Water

Substantially increased social, economic and environmental benefits from water.

Australia has a well-acknowledged water management crisis, driven by population growth, climate change and some perverse consequences of institutional change over the last two decades. The National Water Initiative is the country's water reform blueprint and is in the early stages of implementation. In the first wave of this reform, more than $10 billion will be invested in water infrastructure and management projects over the next five years. The National Water Initiative is built around the idea that reform must be underpinned by sound scientific principles to maximise the effectiveness of these investments.

Through the Water for the Healthy Country Flagship, CSIRO is focusing its research and development efforts on four fundamental needs expressed in the National Water Initiative to:

- revolutionise the way water resources information is collected, interpreted and reported via the establishment of a national Water Resources Observation Network
- provide greater confidence in our national assessments of current and future water resource availability via the Australian Hydrologic Modelling Initiative, linked to the Australian Community Climate and Earth System Simulator
- equip river managers with the science and tools to significantly enhance the health of aquatic ecosystems via judicious allocation of environmental flows and water quality management
- affect a step-change in urban water management and treatment technologies that will make recycling a feasible option in our cities, to address a projected water supply shortage of 800GL/year in 2030.

In addition, CSIRO will address serious issues of soil and water contamination in agricultural, industrial and urban contexts. Our research and development portfolio focuses on the sources, fate and environmental effects of key contaminants such as nutrients, pesticides, endocrine disrupting chemicals, petroleum products and metals. To advance these areas of effort we will employ cutting-edge analytical capability.

Water

- Australia faces a serious water scarcity and quality crisis. Water demand is set to exceed current supply in most Australian capital cities
- The Water for a Healthy Country Flagship is expanding activities in water management, infrastructure and technology to reduce the economic, social and environmental risks associated with Australian water use
- CSIRO's modelling and knowledge diffusion tools are improving national assessments of water resource availability and equipping water managers to make informed decisions about environmental flows and new supply

Aims and directions for the next 4-5 years

- Work with the Bureau of Meteorology to revolutionise the way water resources information is collected, interpreted and reported
- Provide greater confidence in our national assessments of current and future water resource availability
- Equip river managers with the science and tools to significantly enhance the health of aquatic ecosystems
- Affect a step-change in urban water management that will create new water sources to address a projected water supply shortage of 800GL per year in 2030

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Section D

Performance Measurement and Implementation

Measuring Our Performance

CSIRO's success in achieving its mission is primarily dependent on delivering results with relevance and **impact** for Australia.

This in turn is dependent on:

- Building and maintaining strong **relationships** with customers, partners, staff and other stakeholders
- Performing high-quality **science**
- Effective and efficient **resourcing** of activities.

Taken together, indicators of performance over time in these four crucial dimensions will provide a snapshot of the overall effectiveness of CSIRO's strategy.

To provide such a snapshot we have selected key indicators (shown in the box to the right) that pick up important measurable dimensions of the four success factors – without any claim to being comprehensive. The selection of indicators has been informed by the availability and reliability of data, potential behavioural implications and the needs of a variety of stakeholders.

The indicators will be monitored regularly (and performance reported at least annually). Indicative trends (where appropriate) have been set with reference to performance over the full four years of the plan.

Success Measures and Indicators

Impact: Delivering Results with Relevance and Impact

- *Economic, Social, Environmental and Intangible Benefits*
- *Progress to National Flagship Goals*
- *Intellectual Property and Client Reporting*

Relationships: Building and Maintaining Strong Relationships

- *CSIRO Customer and Partner Feedback*
- *CSIRO Staff Satisfaction*
- *Health, Safety and Environmental Performance*

Science: Performing High Quality Science

- *Scientific Output*
- *Infrastructure and Outreach*
- *Capability Assessment*

Resources: Effective and Efficient Resourcing of Activities

- *Revenue Mix*
- *Staff Composition*
- *Investment in Science*

Performance Indicators – Impact

Delivering Results with Relevance and Impact

1. Economic, Social, Environmental and Intangible Benefits

Demonstrate the adoption and impact of CSIRO's products and services through, for example, user surveys, economic analyses and testimonials. Benefits are principally demonstrated as follows:

Economic benefits achieved, for example:

- reducing costs or increasing efficiency of production processes, products or services
- additional revenue generated from new or improved products.

Social benefits, for example:

- improving the health, safety or wellbeing of individuals or groups, or the general community
- increasing the skills or capability of people in ways which enable them to better participate, cope, earn, etc
- people valuing knowledge for its own sake.

Environmental benefits, such as:

- more effective use of natural resources (eg water), reducing pollution, and maintaining biodiversity.

Intangible benefits, for example:

- contributions to global knowledge, national prestige, and support to developing countries.

National preparedness, demonstrated by:

- effective response to actual events (eg bushfires, disease outbreaks etc)
- development of S&T capabilities that can respond to changing needs and opportunities.

2. Progress to Flagship Goals

Demonstrate significant progress toward each Flagship goal over the strategic planning period, with reference to major scientific/technical milestones and development of the 'path to impact'.

3. Intellectual Property and Client Reporting

Demonstrate increasing commercial use of CSIRO intellectual property assets and continuing delivery of client-focussed reports.

Performance Indicators – Relationships

Building and Maintaining Strong Relationships with Customers, Partners, Staff and other Stakeholders

1. CSIRO Customer and Partner Feedback

Continue to improve customer feedback metrics over the strategic plan period.

2. Staff Satisfaction

Maintain or improve the margin between CSIRO's Staff Satisfaction Index and relevant Australian and international benchmarks.

3. Health, Safety and Environment Performance

Building on the substantial progress made in the past five years and continuing to be amongst the best in health, safety and environmental performance, as measured by the Medical Treatment Frequency Rate, Lost Time Injury Frequency Rate and Greenhouse Gas Emissions.

Performance Indicators – Science

Performing High Quality Science

1. Scientific Output

Maintain or increase the number of refereed publications and new inventions per researcher, ensuring maintenance of the quality and impact of CSIRO's publications (compared with relevant benchmarks) as indicated by CSIRO's average citation rate and the average 'impact factor' of journals in which CSIRO papers are published.

2. Capability Assessment

Successfully progressing CSIRO capabilities so that an increasing proportion of capabilities are rated 'benchmark' or 'strong' by independent review panels.

3. Science Infrastructure and Outreach

Effective management arrangements that promote the long-term financial viability of, and access to, National Facilities and Collections. Continue to deliver quality post-graduate student supervision and teacher and student-centred CSIRO Education Programs.

Performance Indicators – Resources

Effective and Efficient Resourcing of Activities

1. Revenue Mix

Maintain or increase revenue per researcher, in real terms.

2. Staffing

Maintain our people profile in line with effective delivery of strategic initiatives.

3. Investment in Science

Continue to grow total investment in the National Research Flagships. Demonstrate other shifts in investment in accordance with ‘Broad Direction Setting’ and specific science investment process (SIP) portfolio decisions.

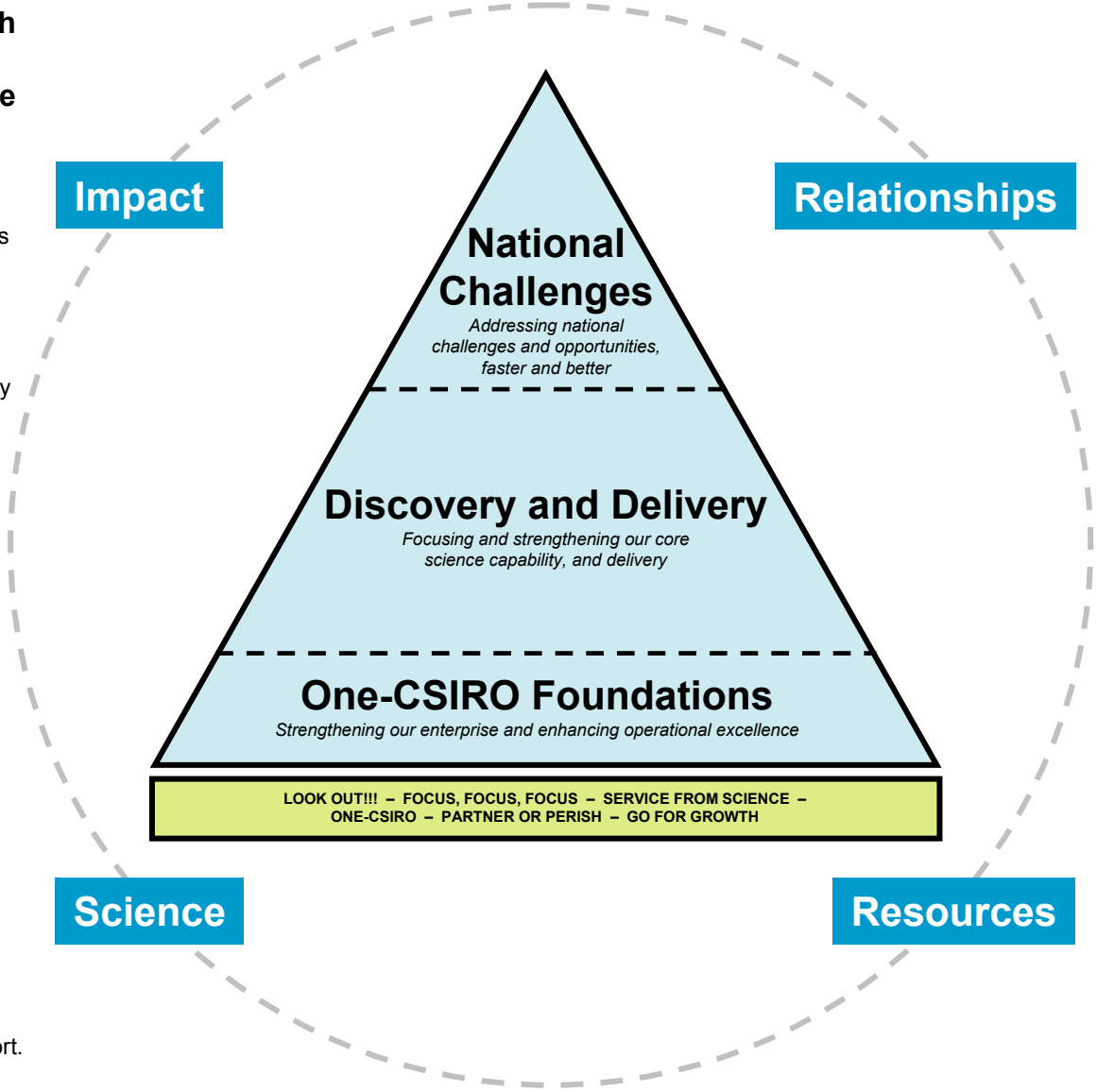
CSIRO will Measure its Success in Four Ways

Delivering results with relevance and impact in areas of importance for Australia:

- Economic, social and environmental benefits such as new products and services
- Significant progress towards achieving National Research Flagship goals
- Increasing commercial use of CSIRO intellectual property assets and delivery of client reporting.

Performing high quality science:

- Scientific output is high, eg. as indicated by the number of peer reviewed publications and citations
- Independent assessment of our science capability and quality
- Sustainable and accessible infrastructure; and delivering quality school (student, teacher) and postgraduate education and training support.



Building and maintaining strong relationships with customers, partners, staff and other stakeholders:

- Continuously improving CSIRO customer and partner feedback
- CSIRO staff satisfaction continuing to exceed international benchmarks
- Superior Health, Safety and Environmental performance.

Effective resourcing of activities:

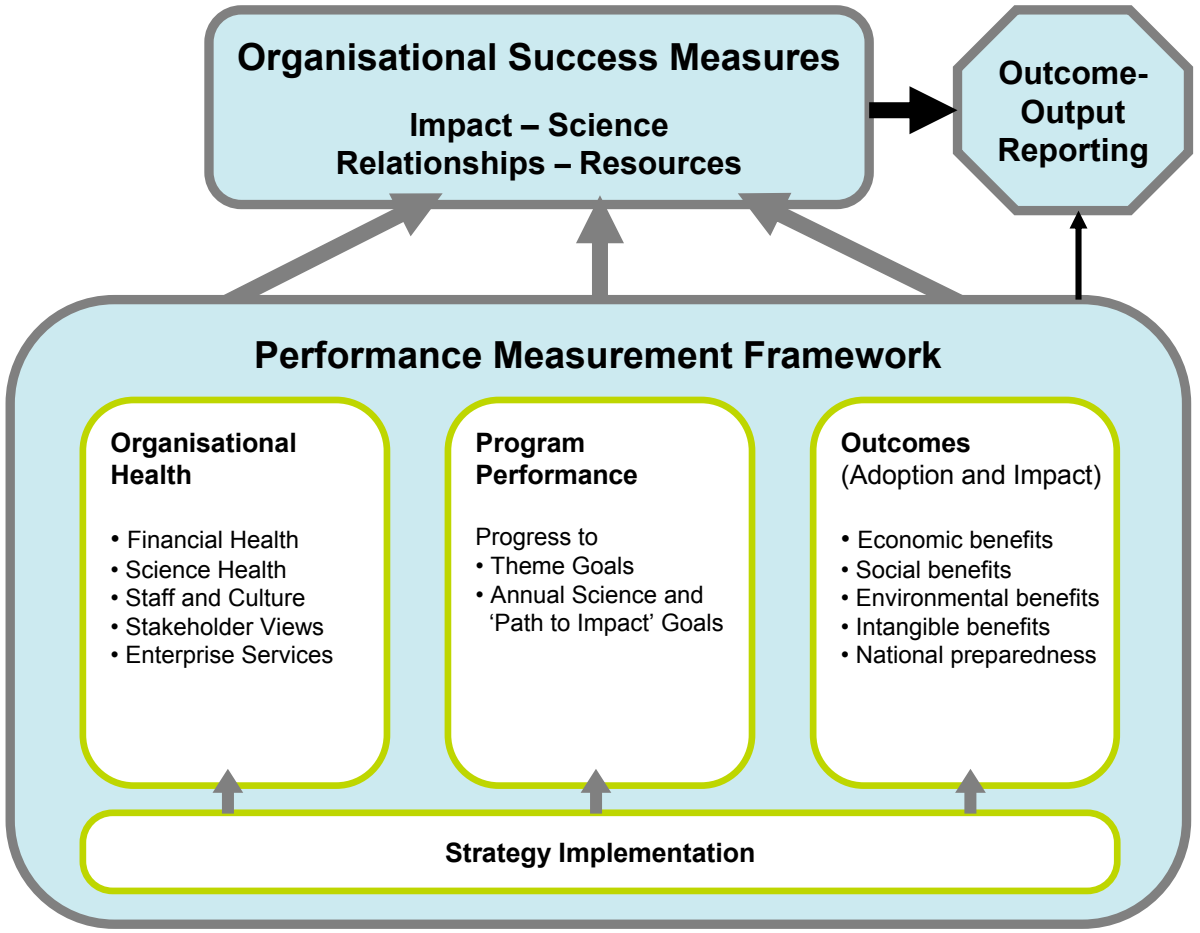
- Optimal revenue per researcher in real terms
- Our workforce profile continues to be aligned with strategic initiatives
- Continue priority investments in science.

Our Performance Measurement Framework

The Success Measures described above are drawn from and underpinned by a Performance Measurement Framework (PMF) that plays a crucial role in keeping us 'on track' toward our goals. It also provides the information foundation for reporting in accordance with CSIRO's obligations under the Government's 'Outcome-Output' Framework.

Using the PMF, CSIRO's management and Board regularly review progress and assess performance in four key dimensions: Strategy Implementation; Program Performance; Organisational Health; and Outcomes (Adoption and Impact).

Taken together, these elements cover strategic and operational considerations relating to performance over both the short and longer term. They also incorporate both an historical and a forward looking perspective – thus providing a strong foundation of information for analysis and management action.



Financial Summary

Projected financial results over the strategic planning period *

	2006-07 (estimated*) $m	2007-08 $m	2008-09 $m	2009-10 $m	2010-11 $m
REVENUE					
Appropriation	610	665	681	700	730
Research Services (Co-investment/Consulting)	305	310	325	350	380
Intellectual Property	36	37	38	39	40
Other (e.g. interest, asset sales, donations)	21	21	22	24	26
Total revenue	**972**	**1033**	**1066**	**1113**	**1176**
EXPENSES					
Staffing	580	610	645	685	730
Operating	300	330	335	345	355
Other (e.g. depreciation)	92	93	86	83	91
Total expenses	**972**	**1033**	**1066**	**1113**	**1176**

* as per the Portfolio Budget Statement (May 2007)

Australian Science, Australia's Future

Your CSIRO

Australia is founding its future on science and innovation. Its national science agency, CSIRO, is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.