



Operational Plan for 2003–2004

CSIRO

Operational Plan

2003-04

CSIRO is an independent statutory authority constituted and operating under the provisions of the *Science and Industry Research Act 1949*. This Act lays out the functions, powers and structure of governance of the organisation.

In summary, CSIRO's primary functions are:

- To carry out scientific research for the purpose of assisting Australian industry, furthering the interests of the Australian community, contributing to the achievement of national objectives or the performance of national and international responsibilities
- To encourage or facilitate the application or utilisation of the results of scientific research
- To carry out services, and make available facilities, in relation to science

Secondary functions specified in the Act include:

- Liaison with other countries in matters connected with scientific research
- Training of research workers
- Establishing research fellowships and studentships
- Co-operation with associations of persons engaged in industry for the purpose of carrying out industrial scientific research
- Establishing, developing, maintaining and promoting standards of measurement
- Collection, interpretation and dissemination of information on scientific and technical matters
- Publication of scientific and technical reports, periodicals and papers

The Act also provides (in Section 10) that CSIRO shall, as far as possible, co-operate with other organisations and authorities in the co-ordination of scientific research, with a view to preventing unnecessary overlapping and ensuring the most effective use of available facilities and staff.

CSIRO Operational Plan 2003-04

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Organisational Chart

Ministers

Education, Science and Training - The Honourable Dr Brendan Nelson MP
Science - The Honourable Peter McGauran MP

CSIRO Board⁽¹⁾

Ms Catherine Livingstone (Chairman)
Professor Suzanne Cory - Dr Terry Cutler - Mr Peter Duncan
Dr Geoff Garrett - Dr Jeffrey Harmer - Mr Brian Keane - Ms Deborah O'Toole
Professor Alan Robson - Dr Ed Tweddell

Executive Team

Dr Geoff Garrett – Mr Mehrdad Baghai – Dr Michael Barber
Dr Ted Cain – Dr Michael Eyles – Dr Rod Hill
Dr Warren King – Dr Steve Morton – Dr Ron Sandland – Mr Mike Whelan

Executive Management Council⁽²⁾

Agribusiness & Health Group

Food Science Australia⁽³⁾ -
Forestry & Forest Products -
Health Sciences & Nutrition -
Livestock Industries -
Plant Industry -

Environment & Natural Resources Group

Atmospheric Research -
Entomology -
Land & Water -
Marine Research -
Sustainable Ecosystems -

Sustainable Minerals & Energy Group

Energy Technology -
Exploration & Mining -
Minerals -
Petroleum Resources -

IT, Manufacturing & Services Group

- Australia Telescope National Facility
- Manufacturing & Infrastructure Technology
- Mathematical & Information Sciences
- Molecular Science
- Telecommunications & Industrial Physics
- Textile & Fibre Technology

Flagship Programs

- Agrifood Top 5
- Energy Transformed
- Healthy Country
- Light Metals
- Preventative Health (P-Health)
- Wealth from Oceans

CSIRO-wide Support

- Business Development & Commercialisation
- Communications
- Finance
- Information Technology Services
- Investment Performance
- People Development
- Property
- Risk Management
- Science Planning

(1) Board membership as from 30 July 2003

(2) The Executive Management Council comprises members of the Executive Team, Divisional Chiefs, and some Corporate Officers - see following page.

(3) Joint venture with the Australian Food Industry Science Centre (Afisc).

Executive Management Council (August 2003)

Executive Team

Dr Geoff Garrett	Chief Executive	02 6276 6132
Dr Ron Sandland	Deputy Chief Executive	02 6276 6127
Mr Mehrdad Baghai	Executive Director: Business Development & Commercialisation	02 9490 8400
Dr Michael Barber	Executive Director: Science Planning	02 6276 6388
Dr Ted Cain	Corporate Secretary; Chair: Risk Management	02 6276 6694
Dr Michael Eyles	Group Chair: Agribusiness & Health Group	02 9490 8341
Dr Rod Hill	Group Chair: Sustainable Minerals & Energy Group	03 9545 8600
Dr Warren King	Group Chair: IT, Manufacturing & Services Group	02 9413 7800
Dr Steve Morton	Group Chair: Environment & Natural Resources Group	02 6242 1742
Mr Mike Whelan	Chief Finance Officer, and Executive Director: Corporate Operations	02 6276 6598

CSIRO Divisions & Divisional Chiefs

Agribusiness & Health Group

Food Science Australia (FSA)*	Dr Martin Cole (Acting)	02 9490 8341
Forestry & Forest Products (FFP)	Dr Paul Cotterill	02 6281 8314
Health Sciences & Nutrition (HSN)	Dr Graeme Woodrow	08 8303 8865
Livestock Industries (LI)	Mr Shaun Coffey	07 3214 2999
Plant Industry (PI)	Dr Jim Peacock	02 6246 5250

Environment & Natural Resources Group

Atmospheric Research (AR)	Dr Greg Ayers	03 9239 4687
Entomology	Dr Joanne Daly	02 6246 4025
Land & Water (CLW)	Dr John Williams	02 6246 5940
Marine Research (Marine)	Dr Tony Haymet	03 6232 5212
Sustainable Ecosystems (CSE)	Dr Brian Keating (Acting)	02 6242 1742

IT, Manufacturing & Services Group

Australia Telescope National Facility (ATNF)	Dr Brian Boyle	02 9372 4300
Manufacturing & Infrastructure Technology (CMIT)	Mr Larry Little	03 9252 6114
Mathematical & Information Sciences (CMIS)	Dr Murray Cameron	02 9325 3203
Molecular Science (MOLSCI)	Dr Annabelle Duncan	03 9545 2470
Telecommunications & Industrial Physics (CTIP)	Dr Gerry Haddad	02 9413 7800
Textile & Fibre Technology (TFT)	Dr Brett Bateup	03 5246 4777

Sustainable Minerals & Energy Group

Energy Technology (DET)	Dr Adrian Williams	03 9259 6889
Exploration & Mining (EM)	Prof Neil Phillips	03 9545 8202
Minerals	Dr John Rankin (Acting)	03 9545 8601
Petroleum Resources (DPR)	Prof Bev Ronalds	08 6436 8650

CSIRO Flagship Program Directors

General Manager: Flagship Programs	Mr Graham Thompson	02 6276 6638
Agrifood Top 5	Dr Allan Green	02 6246 5154
Energy Transformed	Dr John Wright	02 9490 8610
Healthy Country	Mr Col Creighton	02 6263 6038
Preventative Health (P-Health)	Prof Richard Head	08 8303 8865
Light Metals	Dr Tony Filmer	07 3327 4684
Wealth from Oceans	Dr Tony Haymet	03 6232 5212

Other EMC Members

General Manager: Commercialisation	Mr Stuart Beil	02 9490 8122
General Manager: IT Services	Ms Roze Frost	02 6276 6601
General Manager: Operational Performance	Mr Bob Garrett	02 6276 6423
General Manager: Business Development	Mr Peter Lewis	03 9545 2255
Director: People Development	Mr Peter O'Keefe	02 6276 6418
Director: Commercialisation	Mr Nigel Poole	02 9490 8138
Sector Leader: Manufacturing	Dr Ian Sare	03 9545 2787
Co-Directors: Communications (Acting)	Ms Rebecca Scott	02 6276 6639
General Manager: Corporate Finance	Mr John Williams	02 6276 6436
	Mr David Toll	02 6276 6170

*joint venture with the Australian food industry science centre, Afisc

Section One

Introduction and Context

CSIRO's Core Purpose



Figure 1: CSIRO's Purpose

CSIRO's purpose (Figure 1) is simply: "*By igniting the creative spirit of our people we deliver great science and innovative solutions for industry, society and the environment.*"

People are at the centre of everything we do. We work to create the right environment to amplify our talent. We take a "Team Australia" approach.

It is not enough just to have a great idea; we must have impact, solve problems and make a difference. We take a triple bottom line focus in our activities, balancing between commerce and the public good. Great science is our foundation. Getting it out there is our aim.

1.1 Strategic Plan Overview

Background

Building upon the Strategic Action Plans of the last three years (SAP I, SAP II, and SAP III) the CSIRO 2003-2007 Strategic Plan links CSIRO's broad vision for the future with specific annual operational plans that specify current priority initiatives. The strategic goals and objectives outlined in the strategic plan have provided the primary direction for the development of the 2003-04 operational plan.

This operational plan lays out the implementation of the strategy for the coming year and indicates how the organisation's strategy will be implemented and managed for 2003-04. As illustrated in Figure 2, the plan provides a one-year whole-of-CSIRO view of implementation of the Strategic Plan, and anticipates the more detailed planning that takes place to flesh out activities and performance objectives across the Organisation.

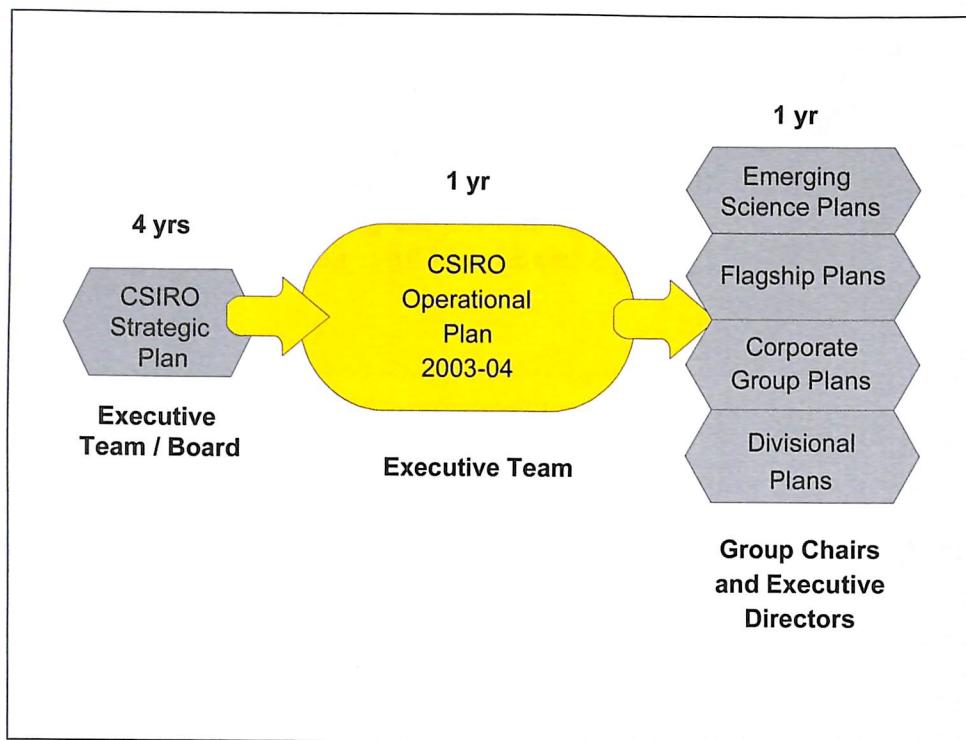


Figure 2: Relationship Between CSIRO Plans

This plan outlines specific initiatives and activities for the coming year as well as providing details of the organisation's budget, annual performance targets and reporting groups that focus our activities for the year. All of these activities are designed to push forward the strategic goals and objectives that appear in our strategic plan.

The balance of this section of the operational plan provides an overview of the 2003-07 CSIRO Strategic Plan.

Strategic Goals for 2003 to 2007

We have set our sights on six key messages (Focus Focus Focus / Look Out!!! / Partner or Perish / Service From Science / “One-CSIRO” / Go For Growth) that will drive us towards achieving the vision of becoming a “research enterprise with global reach.” From 2000 to 2012 these six key messages will provide the basis for our strategic goals. For the strategic planning period from 2003 to 2007 these messages have been refined so as to emphasise the near term creation of a foundation for growth and the need to make difficult decisions along the way.

The six strategic goals for 2003 to 2007 are:

- ***Goal 1- Focusing our science investment***

We are currently spreading our science investment too thinly. During the Triennium, we will continue to focus our efforts to maximise our impact and maintain our competitive standing for quality and scale. We will focus on delivering value to our stakeholders in several ways:

- We will ensure that we are directing our science efforts in alignment with the areas most important to Australia through the National Research Priorities (NRPs). We will deliver meaningful outcomes in alignment with the NRPs.

- We commit to having sufficient scale and quality in our activities to keep our activities relevant and competitive on a global scale.
- We are truly excited about the Flagship programs' opportunity to deliver important outputs relating to some of the most complex and important issues facing Australia. We will concentrate a substantial portion of our energies on our Flagships. Flagships will seek to improve the lives of Australians and to advance key Australian industries.
- We will also develop coordinated investment strategies for other important cross-Divisional activities.

While 85-90% of our energies during the Triennium will be focused on our core research activities and Flagships, we will also encourage significant experimentation in the frontier research areas with 10-15% of our investment resources. Our core research and Flagships are areas where we will press for focus and scale, while in frontier science and emergent opportunities areas we will look for greater diversity and breadth.

- ***Goal 2 – Delivering world class science***

It is not enough to perform science for science sake. We are committed to deliver outputs and solutions that create value for our stakeholders and for Australia. Our efforts must continue to be world-class to remain competitive and to maintain CSIRO's relevance in a volatile world. We recognise that our people are the key to delivering world-class science. However, delivering world-class science requires discipline and careful management as well, which we are working to improve. By continuing to build and foster a world-class team of scientists and leveraging our project management discipline, our worldwide reputation for science leadership should be enhanced across more areas of our work. This should in turn allow us to pursue actively a handful of high profile global facilities in order to boost our ability to deliver returns. High profile global wins, of course, further enhance our reputation and allow us to continue to attract and excite great people.

- ***Goal 3 – Partnering for community impact***

Partnerships allow us to have impact where our efforts alone are insufficient. They also allow us to impact a much broader constituency of communities. We put a high value on partnerships and taking a "Team Australia" approach to creating community impact. We will concentrate on increasing the impact of selective partnerships with Cooperative Research Centres (CRCs) and universities, increasing our engagement in a meaningful way with government to impact policy, partnering with agencies to contribute to the global agenda, and continuing to encourage an informed community through our interactions with the public.

- ***Goal 4 – Serving as a catalyst for industry innovation***

By diligently focusing on the current and future needs of our customers and stakeholders, we make a real contribution to science and to Australia. We see a significant opportunity to add value to small, medium and large corporations, helping boost GDP growth and contributing to industry. We think we can work smarter with businesses of all size. We also believe we can work more strategically with Australian rural development corporations (RDCs) and create win-win situations while contributing to the growth of Australian industry. We believe that information and communications technology (ICT) capabilities are a particularly important cornerstone for the ongoing success and innovation of all of these customer segments. Our

strong outward-looking emphasis on their needs requires us to reinvigorate our ICT capabilities and bring that work across all our activities.

- ***Goal 5 – Building one-CSIRO capabilities and commitments***

CSIRO's scope and scale mean that when we act as a single, unified organisation, the possibilities are limitless. Over the next Triennium, we will continue to lay the groundwork for greater one-CSIRO behaviour. We will focus on the four areas with biggest leverage from acting as a unified organisation.

We have begun important work on aligning our performance management framework across the organisation. This framework will provide robust business planning, good target setting and strong accountability.

We will also work together to present a single, unified point of access to our largest and most important accounts, increasing our ability to provide them with relevant services. These client service teams (CSTs) will allow us to be more responsive to our top clients' needs.

Generating breakthroughs in science comes from working across boundaries. We will foster more cross-disciplined interactions in all areas of our science activities, especially in our frontier research areas.

Delivering value to our stakeholders requires careful discipline and oversight of our activities. We will unify and improve our internal processes and information technology (IT) systems which allow us to collaborate and operate effectively as one enterprise.

- ***Goal 6 – Securing a financial foundation for growth***

Government has urged us to go for growth and we have accepted the challenge. Clearly we need to ensure robust sources of capital funding for that growth. The bulk of our growth will come from our activities in core science, Flagships and related programs, but our financial foundation needs to be in place to support that growth. We must liberate additional capital wherever possible to reinvest in our growth.

Continuing to demonstrate that we deliver a terrific return on our government appropriation is paramount. Delivering value to our stakeholders puts CSIRO in a position to justify receiving increasing funding. We must also stay focused on our own top and bottom lines. We must ensure that we run a professional enterprise, where costs are justified and benefits outweigh those costs. We must actively manage our intellectual property and other assets and pave the way towards growth.

We have to ensure that we create the investment capacity for that growth to happen.

Supporting Objectives

Each of the six goals are underpinned by 4 strategic objectives. These are outlined in Figure 3 below.

CSIRO strategic goals

Focus Focus Focus	1 Focusing Our Science Investment	1.1 Play a significant role in delivering on Australia's National Research Priorities 1.2 Build critical mass and ensure quality in our core research programs 1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries 1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process
Look Out!!!	2 Delivering World-class Science	2.1 Concentrate people processes on developing, attracting, exciting and retaining talent 2.2 Optimise delivery of all research activities by improving project management 2.3 Build our global recognition for science leadership in our chosen science domains 2.4 Help Australia play a leadership role in major international science facilities such as the SKA
Partner Or Perish	3 Partnering For Community Impact	3.1 Focus and intensify collaboration with universities, CRCs and other agencies 3.2 Service the needs of government for informed policy setting 3.3 Enhance communication to raise public and stakeholder excitement and trust in science 3.4 Partner with other agencies to advance Australia's global development contributions
Service From Science	4 Serving As Catalyst For Industry Innovation	4.1 Intensify engagement with rural research and development corporations to grow regional and new industries 4.2 Structure deeper and more meaningful relationships with large corporations 4.3 Accelerate the growth of promising technology-based SMEs 4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries
One-CSIRO	5 Building One-CSIRO Capabilities And Commitment	5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research 5.2 Be among the best in governance, OHS&E and performance management processes 5.3 Adopt a unified approach to improve service dramatically and grow top accounts 5.4 Implement standard processes and IT systems to enhance collaboration and efficiency
Go For Growth	6 Securing A Financial Foundation For Growth	6.1 Secure greater Federally funded support for CSIRO science investment 6.2 Proactively manage patent and equity portfolios to multiply IP-based revenue streams 6.3 Deliver customer value for money and eliminate subsidisation in consulting services 6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment

Figure 3: CSIRO's Strategic Goals and Supporting Objectives

Intensity of Activity

Over the next four years the intensity of activity around any particular objective will vary from year to year. Not all objectives will receive uniform attention each year. Annual priorities shape the intensity of activity around any single strategic objective for a given year. Additionally, not every functional group or Division will be focused on every objective. The mapping of the efforts of different reporting units to the appropriate objectives for 2003-04 is outlined in further detail later in this plan.

Areas of highest intensity of activity for 2003-04 (see also Figure 4) are:

- Focusing and delivering on National Research Priorities (NRPs)
- Focusing and investing in Flagships
- Being globally recognised for science leadership
- Collaborations with universities, CRCs and other agencies
- Engagements with RDCs
- Reinvention of our ICT capabilities
- One-CSIRO governance, OHS&E and performance management
- Securing greater Federally funded support
- Reducing overhead and purchasing costs

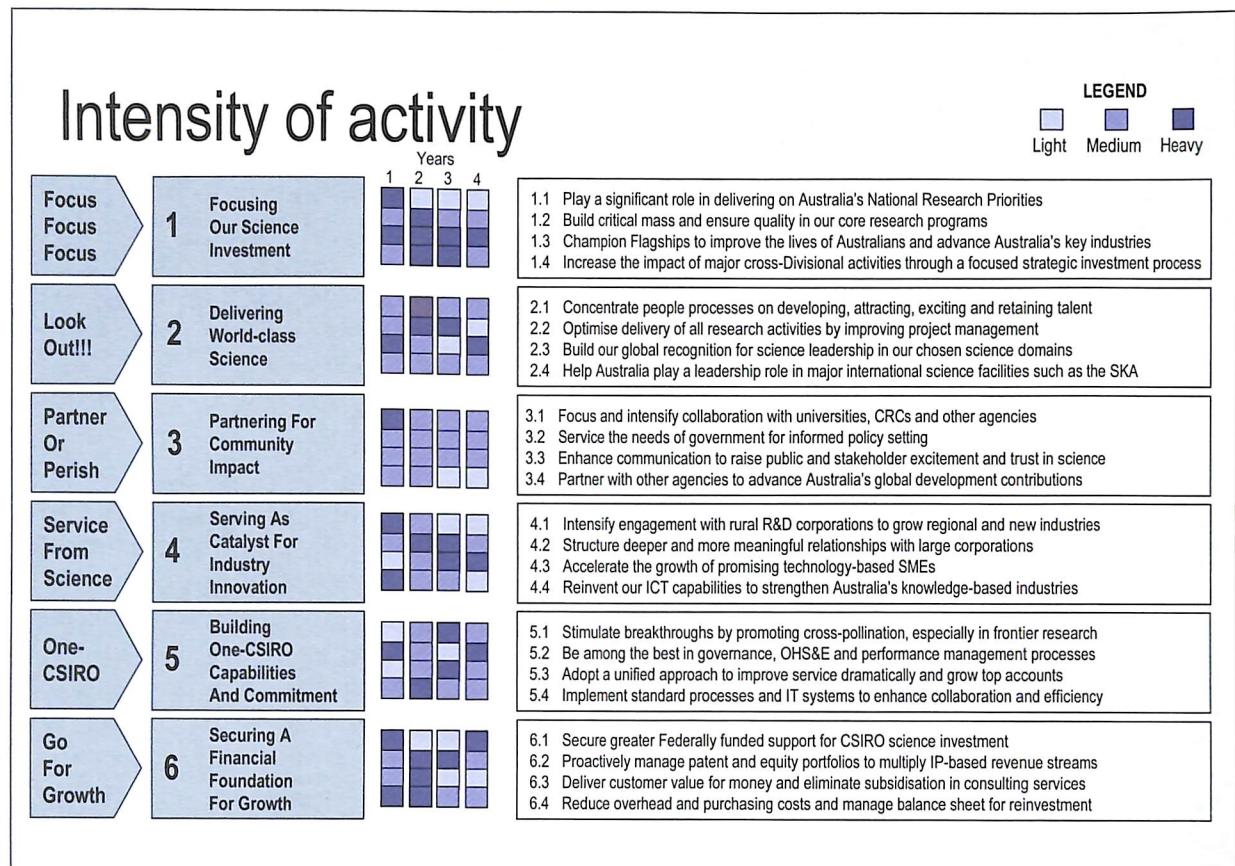


Figure 4: Intensity of Activity Toward Strategic Goals

1.2 Operational Plan Overview

Changing Context

For the last two years, CSIRO has been operating in a rapidly changing environment. Key features of changes in the environment can be described in terms of Global, national and internal factors.

Australian Factors

At home in Australia we face a changing landscape. The recently drafted Australian National Research Priorities (NRPs) highlight some of the most important issues Australia faces. In times of drought and fire and with increasing security concerns, the nation's priorities respond accordingly. Expectations for CSIRO naturally also shift in the face of changing capital markets and funding pressures. Now more than ever, Australia needs a strong CSIRO which is committed to delivering real results.

Internal Factors

We have also taken account of our own internal situation, as we plan for the future. We recognise the need to recruit up-and-coming talent, address staff feedback on a variety of issues and continue to manage change. We recognise the need to maintain the trust associated with our brand, and the importance of securing our financial ability to achieve our goals. Most of all, we note the limits on any organisation's ability to drive change on multiple dimensions. This constraint is the chief determinant of the timing and pace of our initiatives.

Global Factors

Changes in global science trends, forces of globalisation and trade and geopolitical strife all set the stage upon which we operate. Like it or not, we compete on a global stage, just like our customers and partners. Global competition for opportunities as well as for top talent is on the rise. We ignore the global context at our peril.

Continuity and Progression from 2000-2003

What's the same

Much of the work begun in our Strategic Action Plans of the prior Triennium (SAP I, SAP II and SAP III) will be carried forward into this operating plan. These include:

People and Enhancing Teamwork

The importance of our people remains paramount. Attracting, developing and exciting great people is fundamental to our success. We will continue to enhance our performance management processes. We continue to be excited about the changes we are focused on. We also still place a premium on one-CSIRO behaviours. Boundary "porosity" is an ongoing priority. Collaborations and partnerships allow us to leverage our strengths in powerful ways. We continue to take a "Team Australia" approach to our activities.

Delivering Value and Science Excellence

We remain fixated on the need to deliver value to our stakeholders, clients and to Australia. The CIE impact studies of Flagships and star projects will continue. Flagships remain a top priority as vehicles to deliver value. We continue to strive towards stretch targets across the organisation, and still need to think out of the box. The quality of our science is still our lifeblood. We continue to emphasise the need to improve the quality of our science across the board. Great science comes from great scientists armed with tools to deliver.

What's new and different

Many of the strategic goals for 2003-2006 represent a progression from the Strategic Action Plans (SAPs) of the prior Triennium. These areas reflect the increased attention demanded given the priorities over the year ahead.

Greater concentration

We recognise the importance of scale and quality in our science. Science activities within CSIRO that are not of a competitive quality or scale may be cut. We will take more of a portfolio approach to our investment decisions across science areas rather than purely a bottoms-up justification of our science spend. We will also achieve greater clarity around the areas of focus for our science investments. We have a renewed vigour towards the National Research Priorities as well.

More International

We will increasingly look out for opportunities abroad. Increased activities with multi-national corporations (MNCs) and developing nations will be a focus. We will be open minded towards strategic alliances and joint ventures to help achieve scope and scale in global science areas.

Growth As “Impact”

Growing is not just a matter of increasing our external revenues or Federal appropriation. Growth is also about increasing our impact in everything we do. We are adjusting our growth targets and increasing our emphasis on impact rather than simply on size.

Attitude to Risk and Performance Consequences

Overall we will take a broader approach to managing risk across our activities and always try to balance risks with rewards. While we will continue to reward and develop outstanding performers, we will also place a higher priority on managing weak performance.

Managing Top Risks

We are committed to achieving our targeted strategic goals. Identifying and managing the top risks associated with the pursuit of these goals is crucial. We believe the most significant risks we must pro-actively manage over the year ahead are:

Flagship Implementation

Flagships have great potential to impact the lives of Australians and key Australian industries. They represent a new way for CSIRO to organise our activities. As multi-partner ‘Team Australia’ Flagships they are complex to manage. We must execute effectively on the Flagships in order to make internal and external arrangements effective. Monitoring and managing their performance along the way is critical. We will provide milestone-based funding for Flagships, seeking to ensure that Flagships achieve maximum impact.

Business Development and Commercialisation

Our increasing focus on our largest accounts brings substantial upside, however it also increases our dependence on those large accounts. We must balance our focus on our top clients with the need to service all of our customer segments with vigour. Additionally, we expect that several of our “RIPPERs” (reclaimed intellectual property promising extraordinary revenue) or mega-patents will bear fruit over the next four years and we will need to ensure that adequate internal and external resources are dedicated over the coming year to managing those “RIPPERs”.

Resistance to Change

For our changes to succeed, all of our people must be engaged and on board. At the same time, we must be sensitive to the fact that change often creates anxiety, fatigue and strife. We will engage with staff and work closely with our staff consulting group to monitor staff perspectives and encourage open and honest dialogues. We will also continue to engage with the union and watch the pace of change. CSIRO will also maintain active lines of communication both internally as well as externally to proactively anticipate external criticisms from politicians or the media.

External Reviews

CSIRO is operating within a national innovation system that is undergoing significant review. Over the next 12 months it is likely the Government will complete major reviews of collaboration, infrastructure, CRCs as well as finalise the outcomes of the innovation system mapping program. The outcomes of these reviews are likely to have profound implications for the national innovation system and CSIRO. The active engagement of the organisation in these processes will be a major priority over the year ahead.

These risks have been identified and will be managed within the context of a continuing commitment to an active Organisation-wide program of risk identification and assessment. Details of the Organisation's broader risk profile are included in Section 3.3 of this Plan.

Major Resource Re-Allocations

Over the financial year ahead, 2003-04 CSIRO will undertake one of the most significant resource redistributions in its more than 75 year history. With funding for the organisation's newly created Flagship and Emerging Science initiatives coming from a mix of internal resources and additional funding from Government there will be a need to scale back a number of existing areas of research activity.

Internal funding for these new initiatives will be provided from a combination of an across the board 10% contribution from each Division's existing priority research portfolio as well as from additional leverage, where possible, from the linking and integration of existing priority driven research activities with these new programs.

It is important to note that the Flagship and Emerging Science Initiatives outlined in more detail later in the plan, while comprised of project activities performed within a number of Divisions will be managed at an organisation wide level - they are not the domain of a single Division.

In contrast, the balance of priority driven research is largely managed at the Divisional level. Given that the 10% contribution to the Flagship and Emerging Science will come from existing Division based priority driven research areas, the impact of these programs is largely being managed at the Divisional level. The activities to be scaled back or ceased will be selected and managed at the Divisional level.

The overall coordination of the scaling up of CSIRO wide initiatives with the winding back of Divisional based priority driven research is one of the major challenges for the Organisation in 2003-04.

1.3 Implementation and Performance

CSIRO's Outcome-Outputs Framework

CSIRO operates within the Commonwealth Government's formal "outcome-outputs" resourcing framework. CSIRO's outcome statement, reflecting the Organisation's functions defined in the Science and Industry Research Act, is shown in Figure 5 below.

CSIRO's outputs correspond to our three main lines of business.

- Strategic research, directed toward national priorities and other issues of national significance, sustains and builds national research capabilities.
- Contract R&D, consultancy and specialised testing services help solve problems and realise new opportunities for industry and other clients.
- The licensing and exploitation of intellectual property helps create new enterprises based on CSIRO know how and generates revenue by way of licenses and royalties.

The four output groups correspond to the four groups of CSIRO Divisions chaired by a member of the CSIRO Executive Team (see Organisation Chart, page 5). The output groups align with CSIRO's external Sector Advisory Councils and reflect broad groups of beneficiaries of CSIRO's activities.

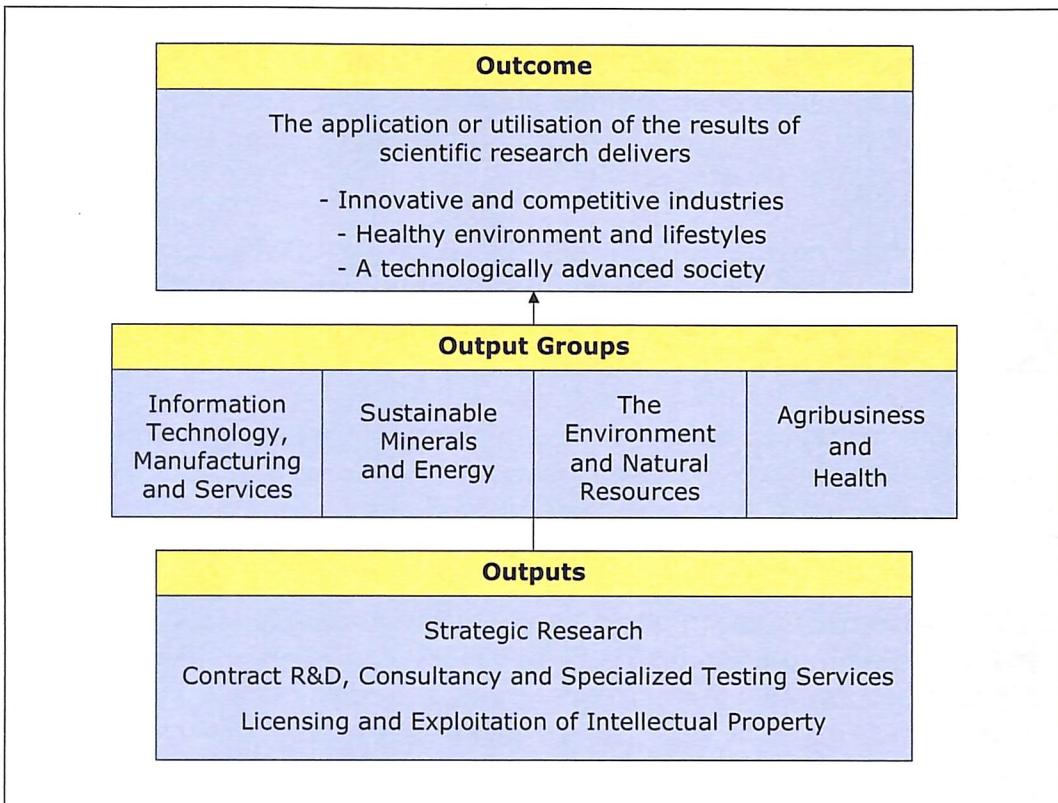


Figure 5: CSIRO's Outcome-Outputs Framework

Planning and Performance Measurement

To support its emphasis on delivering outputs that contribute positively to desired outcomes, CSIRO has developed a Performance Measurement Framework (PMF) that consists of a number of interrelated sets of performance measures and a planning / performance measurement cycle (Figure 6).

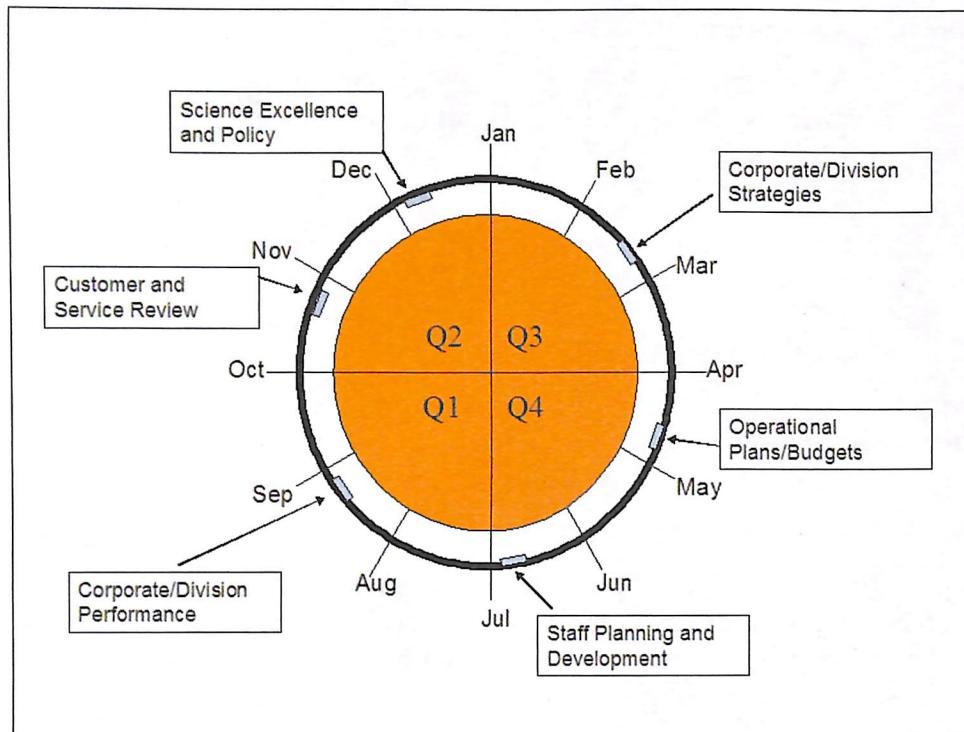


Figure 6: Annual Planning / Performance Measurement Cycle

There are four primary groups of measures. These are:

- Effectiveness and Outcomes Measures;
- Program Performance Measures;
- Organisational Health Measures; and
- Strategy Implementation and Achievement Measures

The interdependent relationship between these measures is represented in Figure 7.

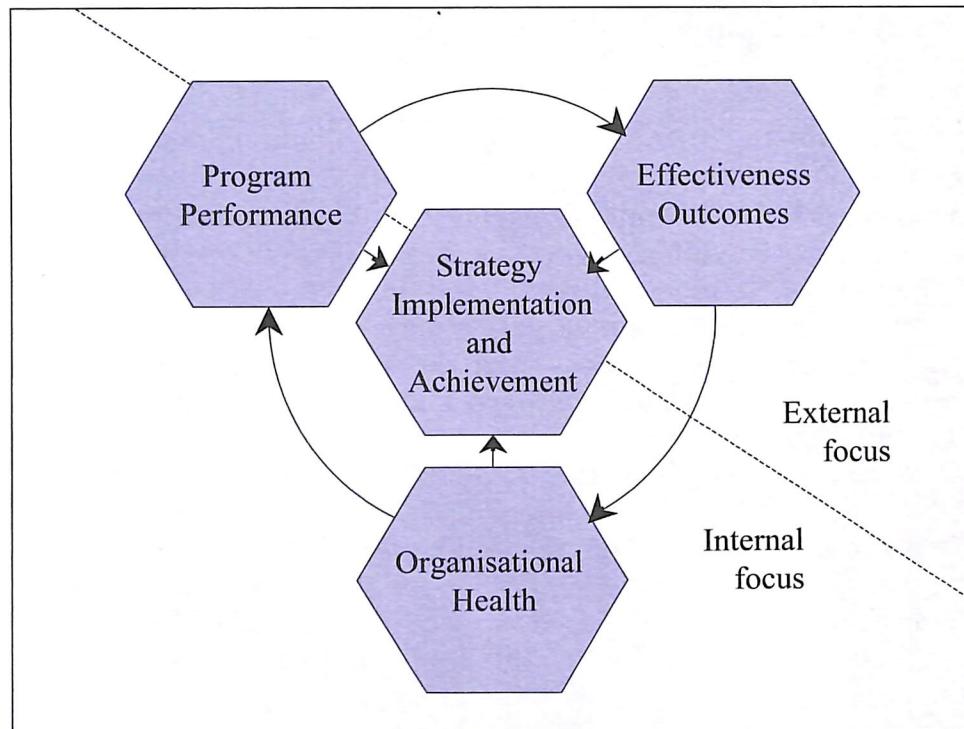


Figure 7: Four Interdependent Types of Performance Indicators

a) Indicators of Effectiveness

The following indicators represent the range of impacts through which CSIRO outputs contribute to benefits across the ‘triple bottom line’ consistent with CSIRO’s Outcome statement.

- Lower (more competitive) production costs
- Improved quality of goods and services
- New products, services and businesses
- Reduced risk
- Development of skills (enhanced human capital)
- Improved health, safety and well-being
- Informing policy (cost-effective public programs)
- Reduced pollution
- Improved environmental health

By appropriately classifying Research and Delivery Partner milestones and tracking progress toward achievement of program goals within the in Program Performance framework, discussed further below, CSIRO will report its outcomes annually on this basis.

b) Indicators of Program Performance

A set of tools has been developed to promote robust business planning, good target setting and strong accountability in the implementation and performance of major programs. The tools are now being applied to Flagship Programs with a view to progressively extending their application through Emerging Science, Priority Driven Core Research and CSIRO-wide Support initiatives.

Important features of the program performance framework (PPF) include:

- clarity of alignment from program goals to project activities (strategic alignment diagrams and program roadmaps) across four levels – Programs, Themes, Streams and Projects (see box below);
- setting of annual performance goals consistent with long-term strategic goals;
- setting targets for both research (or research support) achievements and for the evolution of delivery partner relationships. Appropriate classification of these achievements and deliverables will enable seamless outcome reporting; and
- performance reporting includes the status of long term goals, progress against annual performance goals, and a response plan in the event of significant under/over achievement.

Program: A Program focuses significant CSIRO effort and resources on a clearly defined mission (eg The Preventative Health Flagship Program’s mission is to help Australians to live longer, healthier lives through early diagnosis and prevention).

Theme / Theme Goal: A Theme refers to a major area of research that is directed towards a clear and measurable strategic goal which is a key part of the Program’s mission (eg the Goal for the Colorectal Cancer Theme in Preventative Health is to reduce colorectal cancer incidence by 10% and increase 5-year survival from around 63% to 70% by 2020).

Stream: A Stream represents a collection of related projects that address a particular aspect of the Theme Goal. (eg The Colorectal Cancer Theme Goal is pursued through three streams of activity; Developing protective foods, Developing novel diagnostics, and Developing policies and guidelines). Each Stream has an explicit medium-term Stream Objective supported by specific annual performance goals.

Project: A project is the core unit of research activity and budgetary control within a Division.

The major components of the PPF are illustrated in Figure 8 and the framework is presented in more detail in Section 3.2. Specific annual performance goals for each Stream of research can be found in supporting Divisional, Flagship and Emerging Science plans.

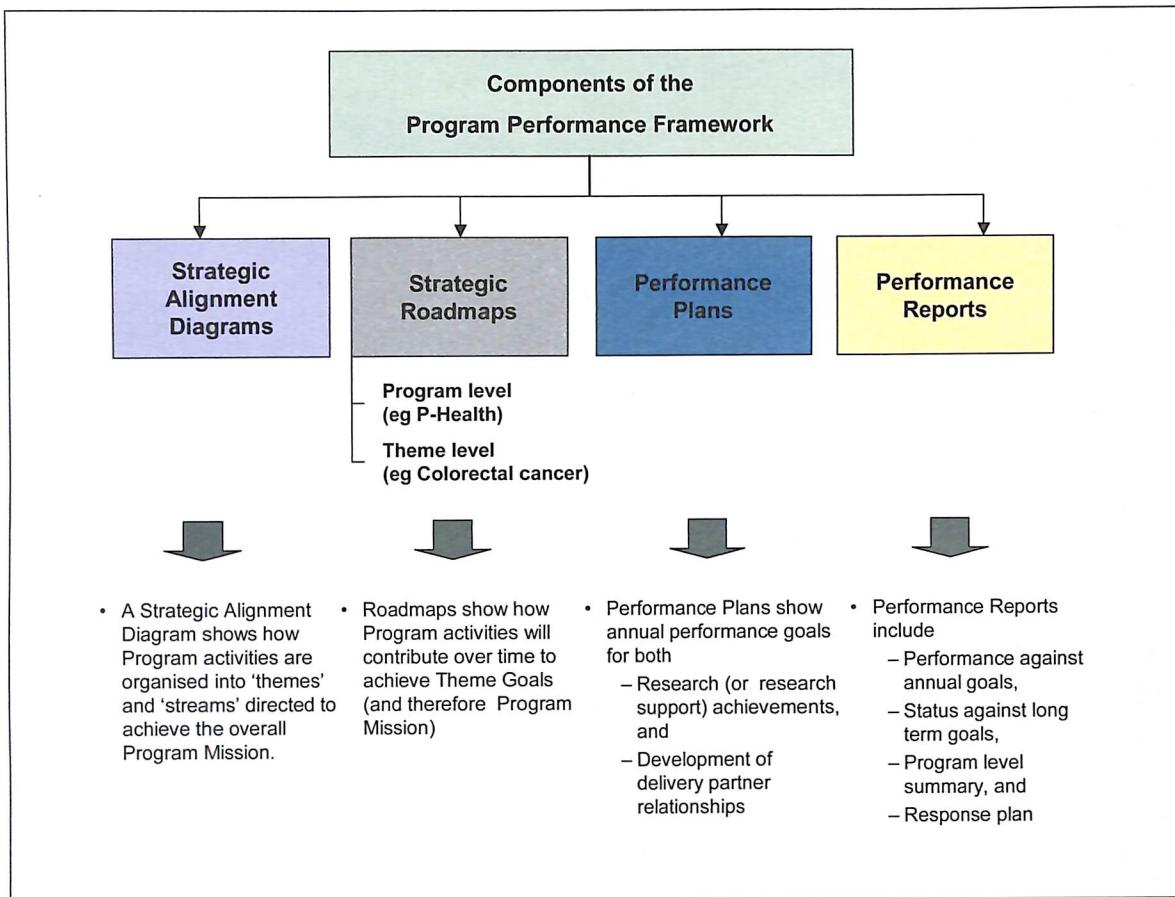


Figure 8: Components of the Program Performance Framework

c) Indicators of Organisational Health

This set of indicators refers to the performance information captured at different levels of the organisation to meet traditional performance monitoring and reporting requirements (eg basic financial and OH&S statistics). Tracking these indicators within individual operating units helps to ensure that our underlying processes remain in a ‘healthy’ condition while bringing to attention any areas that require particular attention. Over time, as major process improvements or change initiatives are identified, different organisational health indicators may be ‘elevated’ to be indicators of ‘strategy implementation and achievement’

d) Indicators of Strategy Implementation and Achievement

This set of indicators refers to the performance measures and targets associated with the goals and objectives articulated in the CSIRO Strategic Plan. A ‘headline measure’ summarises progress against each of the six major strategic goals. These six measures together with measures of staff satisfaction and customer satisfaction will form the highest level of regular strategic reporting to the CSIRO Board. The ‘headline’ indicators are shown in Figure 9 together with the performance targets set for these headline indicators in 2003-04. The measures and targets associated with the supporting strategic objectives in 2003-04, are presented in the box on page 21.

Headline Performance Indicators with Targets for 2003-04

1 Focusing Our Science Investment	 Flagship Implementation Achievement of annual performance goals supporting Flagship Theme goals	70%
2 Delivering World-class Science	 Science Excellence Index ISI Citation rates and patent impact index	Trending upwards
3 Partnering For Community Impact	 CSIRO Brand Preference Importance of CSIRO name (Customer Value Survey score)	125 (6.7)
4 Serving As Catalyst For Industry Innovation	 Industry Engagement Number of significant commercial relationships with industry leaders (RDCs, States, Large Corporations and SME growth stars)	Increase over baseline
5 Building One-CSIRO Capabilities and Commitment	 One-CSIRO Participation Aggregate of Insight Survey scores for 'working relationships' and 'work organisation & efficiency'	127
6 Securing A Financial Foundation For Growth	 Financial Capacity Achieve targeted financial results and, relative to base total funding revenue: (i) increase in appropriation income, (ii) increase in IP revenue, and (iii) decrease in overhead costs	\$30m (04/5) \$8m (03/4) \$4m (03/4)
7 Employee Satisfaction	 Staff Satisfaction Index Broad staff satisfaction index drawn from the annual staff Insight survey and benchmarked against comparable research intensive organisations	Exceed Global R&D Norm
8 Customer Satisfaction	 Customer Value Index CSIRO's overall comparative value rating derived from the Customer Value Survey	110

Figure 9: Headline Performance Indicators

Strategic Goals, Objectives and Success Measures with Targets for 2003-04

Goal 1: Focusing Our Science Investment	Success Measure and Target
1.1 <i>play a significant role in delivering on Australia's National Research Priorities</i>	Government acceptance of CSIRO NRP Plan & maintain the proportion of research aligned with NRPs above 66%
1.2 <i>build critical mass and ensure quality in our core research programs</i>	Implement Program Performance Framework (PPF) across core research program & establish 'critical mass' baseline.
1.3 <i>champion Flagships to improve the lives of Australians and advance Australia's key industries</i>	Recognising the inherent risk in these activities, 70% achievement of annual performance goals consistent with Flagship theme goals
1.4 <i>increase the impact of major cross-Divisional activities through a focused strategic investment process</i>	Identify major cross-Divisional opportunities, implement PPF to establish baseline annual performance goals.
Goal 2: Delivering World-class Science	Success Measure and Target
2.1 <i>concentrate people processes on developing, attracting, exciting and retaining talent</i>	Maintain aggregate of Staff Insight Survey scores for 'engagement' and 'staff commitment' dimensions at or above current baseline of 156
2.2 <i>optimise delivery of all research activities by improving project management</i>	Audit, both internal & external (ANAO), identifies trend improvement and no significant adverse findings.
2.3 <i>build our global recognition for science leadership in our chosen science domains</i>	Rate of increase in citations exceeds ISI benchmark; CHI patent impact index approaches unity
2.4 <i>help Australia play a leadership role in major international science facilities such as the SKA</i>	Significant progress in Australian engagement in LOFAR and forward positioning on SKA
Goal 3: Partnering For Community Impact	Success Measure and Target
3.1 <i>focus and intensify collaboration with universities, CRCs and other agencies</i>	Constructive engagement in responding to Government reviews and establishment of CVS-like collaboration baseline measure
3.2 <i>service the needs of government for informed policy setting</i>	Develop Federal/State Gov't engagement process and establish CVS like baseline satisfaction measure for Gov'ts
3.3 <i>enhance communication to raise public and stakeholder excitement and trust in science</i>	Brand Preference Measure: "Importance of CSIRO Name" - maintain CSIRO score of 6.7 and comparative score > 125
3.4 <i>partner with other agencies to advance Australia's global development contributions</i>	Progress development of the Global Research Alliance "Millennium Water" project and obtain funding. Level of global aid funding (including Australia) secured trending upwards
Goal 4: Serving As Catalyst For Industry Innovation	Success Measure and Target
4.1 <i>intensify engagement with RDCs to grow regional and new industries</i>	Increase RDC co-investment and the number of significant RDC relationships
4.2 <i>structure deeper and more meaningful relationships with large corporations</i>	Increase large corporations' research investment and the number of significant large corporate relationships
4.3 <i>accelerate the growth of promising technology-based SMEs</i>	Increase the number and value of technology-based SMEs engaged with CSIRO
4.4 <i>reinvent our ICT capabilities to strengthen Australia's knowledge-based industries</i>	Recruit Director ICT, develop ICT Research Centre plan and increase investment by \$6m
Goal 5: Building One-CSIRO Capabilities And Commitment	Success Measure and Target
5.1 <i>stimulate future breakthroughs by promoting cross-pollination, especially in frontier research</i>	Establish ESI program including implementation of the PPF across all streams of activity
5.2 <i>be among the best in governance, OHS&E and performance management processes</i>	Complete development of Governance Framework, implement the PPF and improve OHSE outcomes (<i>from March 2003 baselines</i>) - LTIFR (4.8) MTFR (20.0) ATLR (2.3)
5.3 <i>adopt a unified approach to improve service dramatically and grow top accounts</i>	Increase the number of active Customer Service Teams
5.4 <i>implement standard processes and IT systems to enhance collaboration and efficiency</i>	Improve aggregate of Staff Insight Survey scores for 'working relationships' and 'work organisation & efficiency' from current level (127)
Goal 6: Securing A Financial Foundation For Growth	Success Measure and Target
6.1 <i>secure greater Federally funded support for CSIRO science investment</i>	\$30m for 04/05 over and above forward estimates
6.2 <i>proactively manage patent and equity portfolios to multiply IP-based revenue streams</i>	Achieve IP Budget revenue target of \$22m
6.3 <i>deliver customer value for money and eliminate subsidisation in consulting services</i>	Reduce average subsidisation by 30% and achieve aggregate CVS outcome of 110 or higher
6.4 <i>reduce overhead and purchasing costs and manage balance sheet for reinvestment</i>	Undertake research support process review and generate initial savings of \$4m

CSIRO's Operating Platform and Leadership Responsibility

As stated earlier, the strategic planning period from 2003 to 2007 will emphasise execution, delivery and implementation to ensure that we do achieve our targeted strategic goals and deliver value to our stakeholders. This must begin with the Executive Team collectively providing the necessary leadership, and with individual members of the team accepting different roles – as mapped in Figure 10 - to lead, support and execute action toward each strategic objective.

Over the course of 2003-04 this responsibility model will be further developed and integrated with the organisation's developing corporate governance framework and in particular the development of an underpinning operating platform model. An outline of the current development of the model is provided in Section 3.4.

Strategic Goal	Strategic Objective	CE	DCE	GROUP CHAIRS	EDSP	ED BD&C	CFO/EDCO
1 Focusing Our Science Investment	1.1 Play a significant role in delivering on Australia's National Research Priorities 1.2 Build critical mass and ensure quality in our core research programs 1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries 1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	S	L	E	L	S	S
2 Delivering World-class Science	2.1 Concentrate people processes on developing, attracting, exciting and retaining talent 2.2 Optimise delivery of all research activities by improving project management 2.3 Build our global recognition for science leadership in our chosen science domains 2.4 Help Australia play a leadership role in major international science facilities such as the SKA	S	S	E	E	S	L
3 Partnering For Community Impact	3.1 Focus and intensify collaboration with universities, CRCs and other agencies 3.2 Service the needs of government for informed policy setting 3.3 Enhance communication to raise public and stakeholder excitement and trust in science 3.4 Partner with other agencies to advance Australia's global development contributions	E	E	E	L	S	S
4 Serving as Catalyst for Industry Innovation	4.1 Intensify engagement with RDCs to grow regional and new industries 4.2 Structure deeper and more meaningful relationships with large corporations 4.3 Accelerate the growth of promising technology-based SMEs 4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries	S	S	E	L	S	S
5 Building One-CSIRO Capabilities and Commitment	5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research 5.2 Be among the best in governance, OHS&E and performance management processes 5.3 Adopt a unified approach to dramatically improve service and grow top accounts 5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	S	E	S	E	L	S
6 Securing a Financial Foundation For Growth	6.1 Secure greater Federally funded support for CSIRO science investment 6.2 Proactively manage patent portfolio to multiply IP-based revenue streams 6.3 Deliver customer value for money and eliminate subsidisation in consulting services 6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	L	S	S	S	S	E

Key

CE: Chief Executive

DCE: Deputy Chief Executive (with specific responsibility for Communications, People Development and Flagship Oversight)

L = LEAD:

EDSP: Executive Director Science Planning

GROUP CHAIRS: Executive Chairs of the Four Research Groups

S = SUPPORT:

EDBD&C: Executive Director Business Development and Commercialisation

E = EXECUTE:

CFO/EDCO: Chief Finance Officer and Executive Director Corporate Operations

Figure 10: Responsibility Matrix

Section Two

Research and Supporting Activities

2.1 Research - Generating value through world-class science

Priority Driven Core Research

- *Agribusiness and Health*
- *IT, Manufacturing and Services*
- *Environment and Natural Resources*
- *Sustainable Minerals and Energy*

Flagship Programs Initiative

Emerging Science Initiative

2.2 Science Planning - Responding to national priorities

2.3 Business Development and Commercialisation

- **Delivering benefits through effective technology transfer**
Business Development
Commercialisation
Business improvement
Strategic Transactions
General Counsel
Office of the Executive Director

2.4 Office of the Chief Executive - Building the CSIRO 'brand'

- Communication and Outreach*
- People Management*
- Strategic Management*

2.5 Corporate Operations - Providing enabling facilities and services

- Information Management and Technology*
- Finance and Funding*
- Facilities*
- Operational Performance*

2.1 Research (Groups and Divisions)

The core pursuit of CSIRO is scientific research. Research in CSIRO is undertaken in 20 Divisions affiliated into four Groups. Across CSIRO's research portfolio, activities are undertaken across a range of time horizons.

- Horizon One research is associated with mature technologies and is closest to generating a market impact;
- Horizon Two research is associated with developing technologies and knowledge as yet one step removed from making a market impact; and
- Horizon Three research is associated with emerging technologies which are the furthest from market impact (although importantly maybe associated with the creation of entire new markets).

The dimension by which our research will increasingly be focussed and classified in the future is its position within a hierarchy of Major Programs, and supporting Themes, Streams and Projects. This classification method is being adopted across the organisation to enable a greater ability to track the performance of the research portfolio at the Stream level (a collection of projects contributing towards a common stream objective).

These two dimensions are illustrated in Figure 11, and details of the research portfolio - described in these terms - are presented in the next section of this plan.

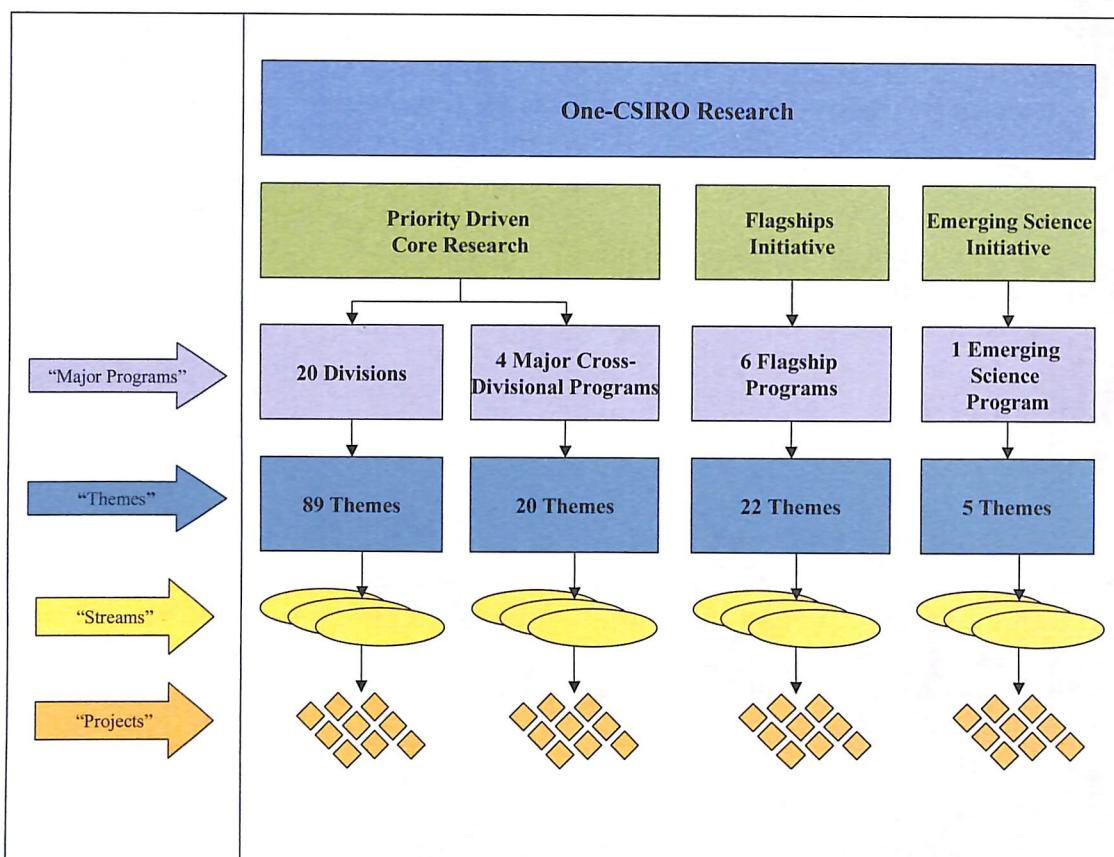
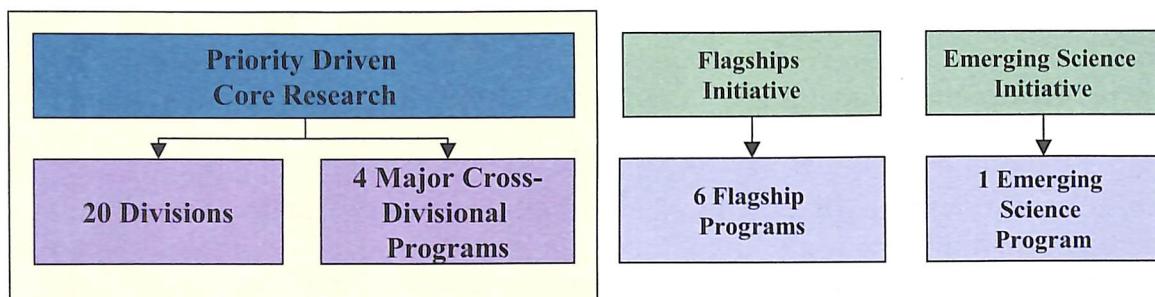


Figure 11: CSIRO's Research Effort

PRIORITY DRIVEN CORE RESEARCH



(a) Nature and Purpose

Priority Driven Core Research (PDCR) yields horizon-1 type outputs and outcomes but importantly also engages with science in the second and third horizons. PDCR is so termed through its alignment with CSIRO's and the National Research Priorities. It presently accounts for the majority of CSIRO's activity and yields the bulk of publications and commercial opportunities.

Major Cross Divisional Programs within certain Groups are PDCR Programs that represent significant collaborative effort amongst a number of Divisions.

(b) Governance Processes

Priority driven core research is carried out in CSIRO's 20 Divisions, under guidance of a Divisional Chief. Each Division belongs to one of four Groups identified on the basis of broad commonalities in outputs produced and markets served, led by a Group Chair.

Group	Chair
Agribusiness and Health	Michael Eyles
Environment and Natural Resources	Steve Morton
IT Manufacturing and Services	Warren King
Sustainable Minerals and Energy	Rod Hill

(c) Key Objectives

The Key Objectives for PDCR in 2003-2004 are to:

- Increase Critical Mass in programs identified as having close alignment with CSIRO's and the National Research Priorities.
- Implement the Performance Framework across Priority Driven Core Research, and identify Themes, Streams and Annual Performance Targets in accordance with the framework.
- Develop appropriate Major Cross Divisional Programs to enhance impact and facilitate resource utilisation.

Agribusiness and Health Group

Group Chair: Michael Eyles

(a) Overview

The Agribusiness and Health Group serves two large and vital sectors of the Australian economy, the agrifood and fibre industries and the pharmaceutical and human health sector. The Group's prime objectives are to enhance the global competitiveness and sustainability of agribusiness industries and to improve human well-being and community health by performing and applying world-class strategic research and providing high quality services. The Group is committed to pursuing these objectives through partnerships in the private and public sectors, both within Australia and internationally.

The Agribusiness and Health Group includes the following Divisions:

- Food Science Australia : *A Joint Venture between CSIRO and the Australian Food Industry Science Centre (Afisc)*
- Forestry and Forest Products
- Health Sciences and Nutrition
- Livestock Industries
- Plant Industry

The Group is uniquely placed to provide outcomes for the target industries through initiatives that are integrated across the value chain, from farm or forest to consumer. The broad outcomes that we seek include:

- profitable production systems for agriculture and forestry that are best practice in terms of productivity and minimising adverse environmental and social impacts;
- high quality, differentiated and market-driven agrifood and fibre products;
- maintenance of access to export markets for Australian products; and
- high-impact technologies and products for preventative health, therapeutics and diagnostics, with emphasis on diseases associated with aging and lifestyle.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	AHG Group Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities	Maintain the present proportion of investment in research aimed at the goals of the National Research Priorities.
1.2 Build critical mass and ensure quality in our core research programs	Employ the CSIRO Performance Management Framework to focus investment in nominated priority-driven research themes and eliminate areas with inadequate scale; build to cross-divisional themes.
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Support and contribute to P-Health, Agrifood Top 5 and healthy Country Flagships.

1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	Contribute to biotechnology, nanotechnology and complex systems science emerging science areas and the Secure Australia initiative.
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Pursue a one-CSIRO approach to developing the “leadership bench”.
2.3 Build our global recognition for science leadership in our chosen science domains	Maintain CSIRO’s world leadership in agricultural, plant and animal sciences as measured by the ISI index.
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Pursue selected major collaborations, including the National Food Industry Strategy Centres of Excellence and joint ventures in forestry and animal science.
3.2 Service the needs of government for informed policy setting	Provide effective science input to policy development through vehicles including the Primary Industries Standing Committee, the National Food Industry Council and other government structures.
3.3 Enhance communication to raise public and stakeholder excitement and trust in science	Engage CSIRO’s scientific expertise more effectively with the public debate on genetically modified organisms.
4.1 Intensify engagement with RDCs to grow regional and new industries	With the Business Development and Commercialisation Group, implement customer service teams to grow engagement with MLA, GRDC and AWI.
5.3 Adopt a unified approach to dramatically improve service and grow top accounts	With the Business Development and Commercialisation Group, implement customer service teams for major existing and potential clients in the private sector.
6.2 Proactively manage patent portfolio to multiply IP-based revenue streams	Implement strategies to maximise value from IP positions in oxygen scavenging and RNAi.
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Continue progress towards elimination of subsidies in consulting work.

Food Science Australia

Acting Chief Executive: Martin Cole

(a) Strategic Position

The food processing industry is a major and growing sector of the Australian economy, with turnover of over \$50 billion and a strong focus on export growth, (especially in meat, dairy and beverages, which together deliver 22% of this revenue). Globalisation of the food industry has created both significant opportunities and threats for the industry. As a result, Food Science Australia is similarly facing the challenges of developing relationships and services consistent with a globalising food industry, increasing international competition for R&D investment, and the objective of promoting a thriving Australian food processing industry.

Food Science Australia seeks new scientific knowledge to enhance the future competitiveness of the Australian food industry, solves today's problems by applying existing knowledge professionally and creatively, focuses on the needs of our customers, whether in Australia or overseas, and adds value to their business.

Food Science Australia is a joint venture between CSIRO and the Australian Food Industry Science Centre (Afisc).

(b) Research Themes

Integrated Food Safety

Theme Goal: To provide the scientific basis for the 'Clean and Green' image of Australian food products through the identification and proactive management of new and emerging food safety hazards and the development of technologies and tools for improving food safety risk management.

Emerging Food Processing Technologies

Theme Goal: To support the development and commercialization of at least two emerging non-thermal food processes within Australia by 2008 leading to a range of differentiated products and processes for export.

Food Processing and Sensing Innovation

Theme Goal: To develop new food processes leading to the commercialization of industrial separation processes for the manufacture of at least three classes of ingredients as well as scale up and commercialization of two new robotic food processing technologies by 2008.

Fermentation

Theme Goal: The effective use of microbial and plant cell cultures to allow improvements in the yield and consistency and new functional properties of Australian cheese as well as the commercialisation of biotransformation technologies for environmental management solutions and the development new ingredients for value addition to food process waste streams by 2008.

Food Storage, Distribution and Packaging

Theme Goal: To maximise the quality and safety of perishable foods to distant markets through an understanding of production and supply chain handling systems leading to adoption and improvement in efficiencies and the reduction of wastage and product rejection by up to 20% nationally and the commercialisation of at least one new active packaging technology by 2008.

Ingredient Functionality

Theme Goal: To gain an understanding of the molecular basis of physical functionality of food ingredients leading to the development of at least two IP positions for novel technologies for the delivery of bioactives by 2008 as well as the development of differentiated ingredients allowing Australian producers to realise a premium in the market place.

Forestry and Forest Products

Chief: Paul Cotterill

(a) Strategic Position

The section of the forestry and forest products value chain serviced by the Division of Forestry and Forest Products is worth \$18 billion p.a. in Australia and has grown 10% p.a. over the last 3 years.

The major growth areas for research needs in forestry and forest products are

- New, innovative and environmentally friendly products for the industry
- Supporting both the growing plantation industry and the growth of commercial forestry in low rainfall areas, and
- To ameliorate environmental problems such as greenhouse gases and salinity.

Major future growth in forestry plantations is expected to be in tropical and sub-tropical areas. In order to meet these research needs and to become a globally significant research provider the Division of Forestry and Forest Products will

- Build research themes on leading positions in the key technologies of remote sensing and process modelling of tree growth, wood quality measurement, bushfire science, developing improved germplasm and additives and treatments for wood products.
- Pursue alliances and mergers with both Australian and multinational industries and other research institutes in Australia and in the region.
- Develop profitable business units to provide research services to the forestry and forest products industry.

(b) Research Themes

Wood Quality Solutions

Theme Goal: To improve the value recovery from harvested timber resources - develop a suite of tools and technologies that link wood properties with wood value by 2008, with at least 50% industry uptake by 2010.

Precision Plantation Solutions

Theme Goal: By 2007 deploy a comprehensive plantation management and inventory optimisation toolbox that will deliver significantly improved commercial and environmental outcomes from Australian plantations.

Development of Improved Germplasm and Breeding Decision Support Tools

Theme Goal: Increase by 50% the end-use value per hectare of plantations established from 2008 onwards compared with existing Eucalyptus pulp wood plantations in Australia. (End-use value per hectare is defined as: growth; survival; strength; stiffness; specific gravity; and, adhesive properties). The market target is replanting the existing Eucalyptus pulp wood plantation estate.

Bushfires

Theme Goal: By 2010 provide fire and land management agencies with the fire prediction tools to manage bushfires for the sustainable management of Australian landscapes and to minimize loss of life and property.

Smart Products

Theme Goal: By 2008, develop a minimum of 14 new products and technologies for the Australian paper-making, wood preservation, wood composites and value added wood products industries which add value and diversify product ranges by:

- Reducing product manufacturing costs
- Improving product performance
- Reducing product and processing environmental impact

Commercial Environmental Forestry

Theme Goal: By 2007, develop a toolbox that will make low rainfall farm forestry profitable.

Health Sciences & Nutrition

Chief: Graeme Woodrow

(a) Strategic Position

The scope of our research ranges from disease prevention through diagnostics to therapeutics and includes capabilities in nutrition, pharmacology, physiology, psychology, sensory science, protein chemistry, protein engineering, proteomics, X-ray crystallography, molecular biology, cell biology, and structural biology. We aim to provide research outcomes which will benefit the global community and the Australian food, health, diagnostic and pharmaceutical industries.

(b) Research Themes

Prevention, Diagnosis and Treatment of Human Cancer

Theme Goal: To contribute to the reduction in human cancer burden by having by 2008:

- four novel dietary approaches and technologies developed
- at least one new diagnostic technology commercialised
- one new therapeutic agent in clinical development.

Substantiation of Health Benefits of Foods and Functional Foods

Theme Goal: To add value to the Australian community and the Australian food industry by:

- clinically assessing the health attributes and consumer acceptance of at least 30 food products and technologies by 2008.

Prevention and Treatment of Diabetes

Theme Goal: Help arrest the increase in diabetes and obesity by:

- development and introduction of a clinically substantiated long term weight control strategy by 2008
- progressing an insulin receptor-based therapeutic into clinical development by 2008.

New Nanotechnology Platforms

Theme Goal: To develop four new platform technologies that improve human health through the diagnosis and treatment of disease by 2008 and to exploit these technologies in conjunction with industry.

Livestock Industries

Chief: Shaun Coffey

(a) Strategic Position

CSIRO Livestock Industries provides innovative solutions and quality services for Australia's livestock and allied industries to enhance their sustainability, competitiveness and prosperity. We will help make Australia's livestock and allied industries a stronger global competitor in the 21st Century through projects that deliver outcomes that will improve sustainability, productivity and product quality for meat, dairy, aquaculture and fibre industries. We will create wealth for Australia by generating partnerships and business opportunities in areas such as biotechnology and agribusiness based on our research. We will, in partnership with others, continue to strive to raise awareness of the excitement and importance of science to our nation.

(b) Research Themes

Improve the Environmental and Social Impact of Livestock Production Systems

Theme Goals: Develop innovative and profitable livestock systems with beneficial environmental and social impacts. Quantify and improve livestock well-being and reduce potential for disease in intensive and extensive husbandry systems. Develop technologies to reduce methane emissions while improving livestock productivity.

Improve Livestock Productivity

Theme Goals: Develop enhanced breeding and selection techniques to increase disease resistance, productivity and product quality appropriate to the various production systems. Develop new feedstuffs and improve feed utilization in ruminants. Develop and refine decision support tools that enhance livestock performance and optimise management of the production system's resources.

Enhance Market Access for Australian Livestock Products

Theme Goals: Maintain AAHL as a world-leading high microbiological security laboratory and the national reference laboratory for the diagnosis and control of exotic animal diseases. Extend national and international linkages that promote cooperative approaches to research on endemic animal diseases and exotic disease threats. Provide expert scientific advice and comment/appraisal on government policies and protocols relating to animal disease control. Develop and commercialise detection methods for managing animal health and assuring food safety.

Designer Livestock and Products

Theme Goals: Lead Australia's efforts to capture the benefits of international genome sequencing initiatives in livestock species. Develop whole of life cycle farming systems and genetic improvement and health management strategies for commercial aquaculture species. Develop advanced reproductive technologies to underpin more rapid genetic improvement. Deliver innovative feeding and management systems to deliver meat and dairy products to tight market specifications.

Plant Industry

Chief: Jim Peacock

(a) Strategic Position

CSIRO Plant Industry carries out research in the plant sciences to make Australia's agri-food, fibre and horticultural industries more profitable and sustainable. A major focus is on improving production efficiency and reliability while maintaining the natural resource base. We are placing increasing emphasis on product quality related objectives for the processing and manufacturing sectors and the development of novel plant products. Our research also contributes to conservation of biodiversity in the Australian flora and the implications of global climate change for natural and agricultural ecosystems.

(b) Research Themes

Advanced Gene Technologies for New Agricultural & Industrial Products

Theme Goal Utilize the new platform technologies of functional genomics and bioinformatics to develop 5 significant new IP positions by 2008 in key areas of genetic and epigenetic control of gene expression and critical areas of food quality characteristics for future market access, development, and renewable industrial feedstocks.

Quality, Differentiated Food & Fibre for Health and Market Access

Theme Goal By 2008 improve Australia's competitive advantage through provision of differentiated new materials for the development and delivery of at least eight enhanced crop and animal products having a uniquely Australian brand image, and with yield, nutrition, flavour and/or health attributes tailored for specific domestic and export markets.

Restructured Agriculture and Biodiversity Sustainability

Theme Goal By 2008 develop and apply best practice management programs for sustainable agriculture production in a regional context to three major agricultural systems preserving environmental and biodiversity values and ensuring reliability and continuity of supply.

Partnerships for Global Agribusiness Development

Theme Goal By 2008 increase by 30% the value of major national and multinational corporation and publicly funded institution alliances aimed at the development of proprietary intellectual property for application in major crop improvement programs.

Environment and Natural Resources Group

Group Chair: Steve Morton

(a) Group Overview

CSIRO's ENR Group exists for two key purposes:

- to develop and share best practice in managing environmental research
- to develop and to apply leading edge environment and natural resources research which meets Australian needs and benefits Australia

Because environmental matters are pervasive in CSIRO, the core Group of environmental Divisions has many interactions across CSIRO and to the many collaborators beyond. Environmental research as a significantly public good activity interacts with and inputs strongly to policy development, public information and awareness as well as producing tools and technologies. The environment Divisions are also active in building links with the private sector in the growing area of environmental industries and in meeting the needs for knowledge and practical solutions to environment and wider sustainability challenges in all sectors.

The ENR Group includes the following Divisions:

- Atmospheric Research
- Entomology
- Land and Water
- Marine Research
- Sustainable Ecosystems

The entry for CSIRO's Major Cross Divisional Program on Climate appears after the Divisional entries.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	ENR Group Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities	CSIRO's ENR research is fully aligned with the NRP "An Environmentally Sustainable Australia", and delivers to several other NRPs. New Flagships meet a number of NRP needs in a focussed way
1.2 Build critical mass and ensure quality in our core research programs	The Complex Systems Science and the Social and Economic Integration Emerging Science initiatives build mass and quality in key environment-related areas
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Healthy Country and Wealth from Oceans Flagships are commencing activities in key ENR areas
1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	NRM Programs are focussed through the Flagship model. A revised Climate Program plans to lift climate (and air) impacts

2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	CSIRO's ENR Group has instituted a coordinated approach to developing potential senior leaders
2.3 Build our global recognition for science leadership in our chosen science domains	CSIRO environmental research has been objectively rated as world leading (ISI), a position which will continue to be driven
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	CSIRO is a partner in 15 of the 18 CRCs covering environmental subjects (the largest CRC group)
3.2 Service the needs of government for informed policy setting	CSIRO ENR research has very close, productive interactions with Government policy and program development. Oceans and NRM policy are recent examples, Climate Policy review is occurring with close CSIRO involvement, and new initiatives in Coastal Policy are being initiated.
3.3 Enhance communication to raise public and stakeholder excitement and trust in science	The Group is working to retain and extend the high public recognition and trust in outputs from CSIRO's environmental research
3.4 Partner with other agencies to advance Australia's global development contributions	The ENR Group is building its extensive global networks in environmental and sustainability science including, for example, through the Global Research Alliance
4.1 Intensify engagement with RDCs to grow regional and new industries	The ENR Group contributes to CSIRO's goal of increasing business with RDCs, especially in terms of better resource management, a keystone of regional prosperity.
4.2 Structure deeper and more meaningful relationships with large corporations	The ENR Group is engaged with environment industries including through core membership of the peak group, Environment Business Australia
4.3 Accelerate the growth of promising technology-based SMEs	ENR Divisions initiate transfer of technology to SMEs in fields such as pest management and wind energy, which activity will be enhanced
5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research	ENR Divisions lead CSIRO investments in Complex Systems Science and in the interaction of knowledge systems inherent in CSIRO's Social and Economic Interactions science initiative
5.3 Adopt a unified approach to dramatically improve service and grow top accounts	CSIRO's new Climate Program, with wider scope and better skills links, will improve the services offered
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	ENR Divisions are moving closer to eliminating all subsidies in consultancies
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	ENR Divisions will work closely with the Corporate Operations Group to identify and realise savings opportunities

Atmospheric Research

Chief: Greg Ayers

(a) Strategic Position

The Division has a strong and nationally recognised focus on climate, weather, pollution and the natural environment. Research is conducted in partnership with the Bureau of Meteorology, the Australian Greenhouse Office, universities and State environment protection authorities. The Division's climate, weather, and pollution modelling software are leading edge internationally. Its capabilities/technologies in global and regional pollution monitoring are excellent. Its activities in atmosphere and Earth observation provide national leadership and enabling science. The markets for the Division's outputs are dominated by Government (State and Federal), with growing links to business and industry, particularly in weather and climate risk, greenhouse gas mitigation and pollution management.

(b) Research Themes

Climate and Weather

Theme Goal: Major outputs are tools for weather and climate prediction and methodologies for climate impact assessment that can lead to strategies for adaptation to variations in weather and climate. The outcome for Australia is minimisation of climate and weather-related risk, and enhanced capacity to respond to impacts of future climate change. This work will deliver better natural resource management, particularly for Australian agriculture and water resources, with additional contributions to the built environment, energy management and banking and insurance industries.

Air Quality and Health

Theme Goal: Major outputs of this work are novel methods to assess the risks of personal exposure to air pollution, building on our expertise in pollution measurement and air quality assessment, modelling and prediction. Delivery is to both government and business and industry. Outcomes for Australia will be improved health, quality of life and amenity for our citizens and reliable Australian data essential to underpinning effective strategies for ongoing minimisation of the health effects of air pollution.

Atmosphere and Earth Observation

Theme Goal: Major outputs are measurements of atmospheric and Earth surface properties and processes that are essential for natural resource management and for reducing uncertainty in climate change and global/regional greenhouse gas emissions. Research underpins national and regional policies on greenhouse gas mitigation. The outcomes for Australia and the international community are national and global environmental protection, contributions to climate change assessments and reduced uncertainty about future climate change.

Entomology

Chief: Joanne Daly

(a) Strategic Position

CSIRO Entomology, one of the world's leading public sector entities undertaking research into insects, aims to generate economic, social and environmental benefits for all Australians through research into insects and their management by:

- understanding the role of insects and other invertebrates in the natural, urban and rural environments;
- developing safe and sustainable methods of pest and weed management;
- using insects as models to understand fundamental biological processes and to devise novel solutions for emerging problems.

The Division works closely with industry through Australian and international enterprises, government departments at local, State and Federal levels, and rural industry R&D corporations. We increase our delivery of our knowledge to end users by working closely with communities. We also partner with universities and overseas government researchers.

Research is applied to developing ecologically sustainable strategies for the management of insect pests and noxious weeds. Other research focuses on use of invertebrates as sensitive indicators of environmental degradation and the development of technologies to remediate contaminants in the environment.

(b) Research Themes

Plant Protection

Theme Goal: Develop resources and methodologies for protection of Australian food, feed and fibre crops against the major insect pests and selected diseases and weeds through: identify key components of insect lipi-proteins, pesticidal proteins and peptides; identification and validation of novel insecticide targets; improved understanding of the biochemistry of insect-host plant interactions; improved methods for management of insecticide resistance.

Product protection

Theme Goal: As the leading provider of stored product and termite management solutions, expand our position in product protection generally, with initial emphasis on soil and timber fumigation; deliver new commercial products in grain aeration and fumigation and create international linkages with research institutes and commercial entities for development and commercialisation of new product protection products; create a national centre of expertise in aroma-sensing technology for grain quality applications.

Biosecurity

Theme Goal: Provide a scientific framework for characterising risk and risk assessment so that biosecurity risks can be efficiently and effectively assessed; provide primary producers with knowledge and tools for managing biodiversity risks at the farm and whole-of-industry scale.

Natural Resource Management

Theme Goal: Provide knowledge to manage exotic species affecting natural environments and tools and knowledge to assess and manage risks of other incursions; develop novel tools and techniques in NRM such as bioinformatics and molecular diagnostics for environmental health; develop underpinning knowledge on insect fauna and biodiversity.

Bio-Industries

Theme Goal: In association with Orica, develop enzymes for remediation of organophosphates produced during industrial processes in the horticulture and wool industries; evaluate the merits of utilising insects, microbes and associated invertebrates as models to develop biological pathways for development of value added raw materials in conjunction with other researchers, and industry.

Land and Water

Chief: John Williams

(a) Strategic Position

CSIRO Land and Water and its partners seek to develop innovative solutions to Australia's land and water management challenges and to deliver options to policy makers and land managers that are economically viable, socially acceptable and environmentally sustainable. Water, its equitable allocation, quality and re-use, is at the core of our business. Our science focus includes the influence of soils, different land uses (both urban and agricultural) and land management practices on cycling and transport of water, nutrient, carbon, salt and other pollutants. Our outputs include predictive models, management solutions and policy advice. Our market is in the natural resource management sector at national and international levels and includes catchment management and other natural resource management agencies and primary industries (dryland and irrigation agriculture, mining and manufacturing industries).

(b) Research Themes

Water Allocation and Quality

Theme Goal: Predictions, methods, models, guidelines, social assessments and policy advice on surface and groundwater management and allocation for different users in water utilities and the irrigation industry; guidelines for restoration of aquatic ecosystems and environmental flow demands; development of management strategies for water bodies to minimize contamination and algal blooms.

Urban Water Reuse

Theme Goal: Development of understanding and tools for efficient urban water use and, in particular, development and initiation of an urban water reuse program with an initial focus on aquifer storage and recovery and minimization of microbiological risks.

Land Use Options

Theme Goal: Guidelines and methodologies for land managers providing new land use options which are sustainable in terms of catchment, soil, groundwater and economic and social factors; engineering solutions for salinity control; advice to governments on impacts of landscape and climate change in temperate and tropical environments.

Environmental Contaminants

Theme Goal: New guidelines based on assessment of risk from contamination, including impacts on ecological systems and human health, and development of inexpensive technologies and clean-up options.

Marine Research

Chief: Tony Haymet

(a) Strategic Position

CSIRO Marine Research is committed to helping Australia realise the benefits of the nation's extensive marine territory, now and into the future. Our mission is to explore and understand the marine environment and its relationship with climate, and the terrestrial environment, and the utilisation of marine resources. CMR employs an integrated and multidisciplinary approach to marine science. Our research identifies the key biological, chemical, physical and socio-economic processes that influence the health and productivity of marine ecosystems, in order to improve the predictability of changes in the marine environment and, through climate, Australia's land. CMR scientists work in partnership with other research institutions, managers and stakeholders to foster and promote the ecologically sustainable development of Australia's ocean and climate-influenced terrestrial resources.

(b) Research Themes

Sustainable Fisheries

Theme Goal: Improve understanding of the physical, biological and human processes affecting fisheries, provide risk assessments and quantitative models of fishery dynamics and ecosystems, and tools to build and test management strategies for Commonwealth and international fisheries. This work will lead to ecosystem-based management of ecologically sustainable fisheries, ensuring a balance between utilisation of the ocean's resources and conservation of ecosystem function.

Sustainable Aquaculture Production

Theme Goal: Integrate the development of novel breeds, feeds and production environments to achieve a stepwise transition from wild genotypes to selectively bred superior genotypes adapted to maximise production efficiency, profitability, sustainability and market penetration. This will lead to enhanced profitability, competitiveness and sustainability of Australia's aquaculture industry.

Sustainable Marine Ecosystems

Theme Goal: Develop the science and tools to characterise, monitor, predict and manage marine ecosystems at the whole-of-ecosystem level, recognising links across physics, biogeochemistry, trophodynamics, population and community ecology, and interactions across time and space scales. This work provides the scientific basis for the development, implementation and monitoring of Regional Marine Plans, a key objective of the Commonwealth under Australia's Oceans Policy.

Climate Processes and Prediction

Theme Goal: Reduce the uncertainty in climate predictions by advancing the knowledge of ocean physics and ocean biogeochemical cycling through observations and models. This will increase the credibility of predictions of climate change and variability and lead to positive economic and environmental outcomes for Australia's terrestrial and marine sectors.

Marine Environment Prediction

Theme Goal: Develop and support the delivery of systems for marine environment prediction in partnership with the Bureau of Meteorology and the Royal Australian Navy. The research will combine marine observations and models into state-of-the-art systems to interpret and forecast the state of the marine environment. This will provide timely, accurate and detailed information on the past, present and future state of the ocean and marine environment to support the exploration, use and management of Australia's marine jurisdiction.

Sustainable Ecosystems

Acting Chief: Brian Keating

(a) Strategic Position

The national goal of an environmentally sustainable Australia is central to the R&D of CSIRO Sustainable Ecosystems (CSE). We work towards this goal by understanding the connections between natural, agricultural, industrial and urban ecosystems and the degree to which the management of these systems is shaped by economic and social processes. Building effective partnerships with industries, resource managers, communities and policymakers is fundamental to our efforts to ensure R&D leads to beneficial change.

Our work is characterised by a number of research Themes: healthy regions and communities; prosperous rural enterprises; sustaining biodiversity and ecosystem services; national options for long-term sustainability; international partnerships for sustainability; healthy urban ecosystems; and promoting innovative partnerships. These Themes are incorporated into our research projects which range from: conservation biology to agricultural production; ecological monitoring to farm system modelling; and managing pest animals to sustainable regional development.

(b) Research Themes

Healthy Regions and Communities

Theme Goal: Rural and regional communities with options to address and adapt to economic, environmental and social change. Our work includes use of systems analysis to help guide sustainable regional development, research on best use and management of limited resources through resource governance models, and investigation of methods for working in partnership in provision of R&D for community development.

Prosperous Rural Enterprises

Theme Goal: Prosperous and sustainable rural enterprises driven by innovative management, attuned to the Australian environment, and adapted to global change. Our R&D focuses on conducting on-farm systems analysis, in partnership with landholders, to inform and improve management of agricultural enterprises. A key challenge for this work is the need to balance production and conservation goals for an environmentally sustainable Australia.

Sustaining Biodiversity and Ecosystem Services

Theme Goal: Natural and modified landscapes that sustain biodiversity and provide the ecosystem goods and services that support rural and urban communities. This Theme seeks to identify means for achieving conservation on natural and modified landscapes and to analyse potential methods for rewarding landholders who provide ecosystem goods and services (such as pest control and waste assimilation) that benefit the wider community. Included in this work is the wise use of molecular ecology for improved human welfare and ecosystem sustainability.

National Options for Long-term Sustainability

Theme Goal: An Australian society making well-informed choices about national resource policy, management and investment options. Achieved through modelling the stocks and flows of materials and energy in the physical economy that supports sustainability in Australia. Also taking into consideration climate change and variability and its impact on biodiversity and the management of water, cropping and pastoral lands.

International Partnerships for Sustainability

Theme Goal: Partnerships with Australian aid agencies, international NGOs and international research agencies that lead to research, development and capacity building in other countries and within CSIRO. Our systems approach to sustainability is specifically applied in the areas of biodiversity and conservation planning, farming systems, and pest control.

Healthy Urban Ecosystems

Theme Goal: Healthy urban ecosystems, bringing together environmental health and community well-being, through innovative approaches that reduce consumption of resources and improve quality of life. Opportunities are being sought to develop this new and presently small field of work.

Promoting Innovative Partnerships in CSE

Theme Goal: Improved science and business delivery strategies for innovative partnerships, better engagement of stakeholders, practical application of outcomes, and continuous improvement. The learnings from the whole-of-system approach that is applied throughout natural resource management are incorporated into research and development activity for effective business systems and partnerships.

Climate – Major Cross Divisional Program

(a) Strategic Position

For 15 years CSIRO has had a major cross-Divisional climate research program. It is being reviewed in 2003 to fully reflect science advances and changing policy demands (with major Commonwealth and State reviews of climate and energy policies in train). The Program links core climate science with applications in adapting to climate change and variability, and in mitigating emissions. It links closely to other work across CSIRO including in several Flagships and relies upon major partnerships beyond CSIRO in both science and application. Indicative Themes and Goals follow.

(b) Research Themes

There are six themes within the Climate Cross Divisional program: two addressing the underpinning science of climatology (“understanding climate systems”, “earth systems science”), two addressing the utilisation of this science (“measuring, forecasting”, “predicting and adapting to impacts of climate change”) and two addressing emissions mitigation (“biological systems”, “industrial systems”).

Understanding Climate Systems

Theme Goal: To develop and effectively disseminate new knowledge of the total climate system and its influences on Australia.

Earth Systems Science

Theme Goal: A greater ability to utilise climate-related knowledge in applications and management through process understanding which integrates current climate system science with more extensive hydrological and ecosystem modelling, linked also with social and economic factors.

Measuring and Forecasting

Theme Goal: Measurement and forecasting tools able to forecast changes to climate at a range of space and time scales which are increasingly useful to resource managers, and other users.

Predicting and Adapting to Impacts of Climate Change and Variability

Theme Goal: Integrated knowledge of likely impacts of climate change and variability, at regional and other scales, linked to understanding of ways to manage risks facing various sectors and activities and to adapt to the predicted change.

Biological Systems

Theme Goal: Management tools and technologies to abate emissions from (and to increase the emission sinks role of) natural systems including agricultural, forestry and marine systems.

Industrial Systems

Theme Goal: Management tools and technologies to abate emission in industrial systems including in energy production and its various uses.

IT Manufacturing & Services Group

Group Chair: Warren King

(a) Group Overview

The group contains the core of CSIRO's research focus in the ICT, manufacturing, and service sectors. The Group is also currently host to the National Measurement Laboratory, a national facility (which is likely to change during the course of 2003-04 with the creation of the National Measurement Institute).

The main aim of the Group is to improve the competitiveness of Australian industry with particular emphasis on the service sector, manufacturing, ICT, textiles, pharmaceuticals, human health, chemicals and plastics, and infrastructure. The external drivers demanding research in these areas include requirements for products which are globally competitive, are cleaner, cheaper, smaller, faster, and less power consuming, and for the delivery of sophisticated services which are available anywhere, anytime.

Common strengths across the Group include materials technology, communications systems, information handling, simulation and modelling, robotics and intelligent systems, interface engineering, and bio, nano and micro technologies.

In addition, the Australia Telescope makes an important Australian contribution to international science via its operation and development of the telescope for international radio astronomy.

The IT, Manufacturing and Services Group includes the following Divisions:

- Australia Telescope National Facility
- Manufacturing and Infrastructure Science
- Mathematics and Information Science
- Molecular Science
- Telecommunications and Industrial Physics (hosting the National Measurement Laboratory)
- Textiles and Fibre Technology

Entries for two of CSIRO's Major Cross Divisional Programs follow the Divisional entries:

- The ICT Centre of Excellence
- Secure Australia

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	ITMS Group Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities	Make significant contributions to breakthrough science, frontier technologies, advanced materials, as well as promoting Safe Australia, the ICT Centre, and the National Hydrogen Centre.

1.2 Build critical mass and ensure quality in our core research programs	Use the Program Performance Framework (PPF) to focus research efforts
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Take significant roles in Light Metals, Energy, and pHealth Flagships.
1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	Joint planning of ICT across CMIS and CTIP; active involvement in Safe Australia; multilateral involvement in Nanotech, ICT, Complex Systems emerging science areas; and planned growth of activities in SKA/LOFAR; develop high impact cross-Divisional projects in e-science.
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Intensive programs to increase PhD and Post Doc programs; continued investment in Fed Fellows; development plans for select staff
2.2 Optimise delivery of all research activities by improving project management	Implement PMI; analyse CVS results
2.3 Build our global recognition for science leadership in our chosen science domains	Updating citation/research worker index, world benchmarking; compete for Fed Fellows; appoint a research director in ICT of international standing.
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Spearhead the initiative to host LOFAR and SKA in Australia; collaborate to develop the key technologies
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Increase collaboration with selected key universities; establish MOUs with a subset of these; increase the number of ARC PDs; engage with professional societies; encourage joint appointments; engage actively with partnering CRCs
3.2 Service the needs of government for informed policy setting	Continue involvement with State Governments in ICT policy; provide policy advice in ICT, security issues, transport, and manufacturing
3.3 Enhance communication to raise public and stakeholder excitement and trust in science	Continue Open Days on annual basis; participate in Science Meets Parliament; Science in Schools; continue to support Parkes Visitor Centre; cooperate with NICTA and DSTO to organise the first National ICT Outlook Forum
3.4 Partner with other agencies to advance Australia's global development contributions	Partner with European Union in Sixth Framework water-related asset management
4.1 Intensify engagement with RDCs to grow regional and new industries	Lead the CST for Australian Wool Innovation; continue to engage with RIRDC on production of chemicals from biomass
4.2 Structure deeper and more meaningful relationships with large corporations	Participate or lead CST teams on Boeing , BAE Systems, Pacifica Holding, Dow, Procter and Gamble, GMH; DuPont; TRW; Schering Plough, Pfizer
4.3 Accelerate the growth of promising technology-based SMEs	Support Corporate BD&Cs Growth Partnership Program;

4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries	Ensure ICT Centre is fully operational as a joint centre by July 2004
5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research	Encourage "blue sky" and skunkworks projects; establish open lab environment for Horizon 3 research; promote work at the interfaces – biomaterials, biocatalysis, polymer electronics, advanced materials, biomimetics
5.2 Be among the best in governance, OHS&E and performance management processes	Extensive training in management performance; mandatory OH&SE supervisor training and workplace safety assessments
5.3 Adopt a unified approach to dramatically improve service and grow top accounts	Active involvement in BD&C Initiatives, training to staff on customer satisfaction; identification of areas requiring improvement from CVS surveys and more focussed reviews of performance in delivering projects.
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Move to simplified contracts ASAP; improve existing and build new extranet sites
6.2 Proactively manage patent portfolio to multiply IP-based revenue streams	Pursue royalties; pursue IP sale via the WWW; appoint IP manager; continually review Renoirs in the closet
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Continually review fee-for-service pricing and customer service; continue to reduce subsidisation by education and communication; ensure all costs are specified at the planning stage
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Move to preferred supplier agreements; consider locations of staff;

Australia Telescope National Facility (ATNF)
Acting Director: Ray Norris

(a) Strategic Position

To operate a world-class National Facility for radio astronomy supported by leading-edge technical innovation, and high quality astrophysical research.

(b) Research Themes

National Facility Operations

Theme Goal: Operate a world-class National Facility in radio astronomy.

Technology Development

Theme Goal: Develop technology to continuously upgrade our own telescopes, build instruments for other observatories and develop international linkages.

SKA (Square Kilometre Array)/LOFAR (Low Frequency Array)

Theme Goal: Play a key role in developing the next generation of major radio astronomy facilities.

Astrophysics

Theme Goal: Conduct cutting-edge research in astrophysics to solve fundamental problems of the Universe and stretch the performance of our telescopes.

Manufacturing and Infrastructure Technology

Chief: Larry Little

(a) Strategic Position

CSIRO Manufacturing and Infrastructure Technology (CMIT) core purpose is to help create new businesses, solving major problems and providing technology support to Australia's manufacturing and infrastructure industries through its critical mass, core science capabilities and commercial expertise.

The manufacturing industry is a major contributor to Australia's standard of living and national economic performance accounting for over 13 percent of GDP. In 2000-01 it had a combined turnover of over \$230 billion and generated an industry value add of over \$74 billion. The industry employs over 1.1 million people and pays wages and salaries of over \$35 billion per annum.

Our infrastructure also underpins the performance of the wider economy, the delivery of essential services and ultimately our standard of living. In the construction, utilities and communications segments alone over 920,000 people are employed adding value to GDP of over \$66 billion.

CMIT is committed to enhancing Australia's industrial base in national priority areas like nanotechnology, light metals, developing an innovative sustainable automotive industry, building and managing our infrastructure for a competitive nation and developing sustainable manufacturing industries through innovative systems, products and processes. CMIT's, flexible research base will also enable rapid redirection of skills to address unforeseen issues in these areas.

(b) Research Themes

CMIT is focusing research efforts in five core capability areas identified considering divisional strength, unique capabilities, Flagships, emerging science and one-CSIRO initiatives. CMIT themes reflect those five areas as summarized below.

Energy and Thermo Fluids Engineering

Theme Goal: Improve systems comprising flows of energy, heat and fluids, by using integrated mathematical and physical modelling tools to gain understanding and provide innovative solutions that underpin, for example: sustainable energy production and use; process innovation, control and design; reduced domestic, commercial and industrial emissions; and improved monitoring and treatment of human illness.

Complex Systems Integration

Theme Goal: Develop robust and high performance automated systems and adaptive networks using system theory, complex system science and information modelling for specialized applications Demonstrate intelligent engineering systems with automatic flexibility to deal with unforeseen events, and that will self-configure, self-repair and adapt to changing conditions or new requirements with minimal human intervention.

Novel Materials and Processes

Theme Goal: Design and study materials at a molecular level to create high added-value products and associated manufacturing platforms in a sustainable manner.

Sustainable Built Environment

Theme Goal: Optimise whole of life performance of buildings and infrastructure systems via their design, construction and management.

Elaborately Transformed Metals

Theme Goal: Develop new light alloys and extend casting, welding and surfacing processes to make new light alloy, fabricated and multi-layered parts more efficiently.

Mathematical & Information Sciences

Chief: Murray Cameron

(a) Strategic Position

CSIRO Mathematical and Information Sciences (CMIS) research is aimed at developing information infrastructure, tools and quantitative analytical methods to support information users (including decision-makers and researchers) and information providers. The strategy is to develop technology to address problems in a particular application domain and then to leverage research by applying the results in other domains.

Internationally, the major trend is the rapid adoption of the benefits delivered by developments in ICT in all areas of science and technology and all areas of the economy. CMIS aims to position itself to be an Australian leader in accelerating this trend through research leading to new products and services and delivery of innovative solutions. CMIS' Research Priorities focus on managing and using data and information from large, heterogeneous and distributed sources and on modelling, analysing and simulating large complicated systems.

(b) Research Themes

Biotechnology & Health Informatics

Theme Goal: By 2008 develop intellectual property for mining and analysing biological and clinical data that will impact applications in human health and agriculture.

- A world leading IP position in array informatics evidenced by commercial returns
- A first class national capability in bioinformatics and data mining
- Commercial uptake of image processing for biotech applications
- Identified clinical pathways and lifestyle factors that increase the risk of colorectal cancer.

Environmental Monitoring & Management

Theme Goal: By 2008 provide natural resource managers with at least 6 world-class quantitative analytical solutions to environmental issues focusing on the key areas of improving water quality and security of water supply; measuring and assessing indicators of environmental health (e.g. salinity, greenhouse gas emissions); and increase both the profitability and sustainability of our fisheries.

Decision Making for Industrial Processes & Business Services

Theme Goal: By 2008, substantially reduce costs and improve quality and productivity of processes in manufacturing, mining, infrastructure and service industries through the development of at least 6 world class analytical tools and technologies.

Molecular Science
Chief: Annabelle Duncan

(a) Strategic Position

CSIRO Molecular Science seeks to create value and wealth through innovation in focussed areas, leading to new products, processes and businesses. The technology innovations will be underpinned by our scientific excellence in chemistry and biology. We apply science and technology to solve problems and create opportunities in the chosen areas of: Biomaterials, Bioactive Molecule Discovery, Biocatalysis, Diagnostic Devices, and Polymeric Materials.

(b) Research Themes

Biomaterials

Theme Goal: To develop synthetic materials that are compatible with biological systems to improve the health and well-being of Australians, e.g. artificial ligaments, extended wear contact lenses, engineered tissue/polymer hybrids.

Bioactive Molecule Discovery

Theme Goal: To design and synthesise novel molecules with specific application in the pharmaceutical, veterinary drug and crop care industries.

Biocatalysis

Theme Goal: To develop new technologies using biological processes (e.g. novel microbes or enzymes) to efficiently produce high-value chemicals.

Diagnostic Devices

Theme Goal: To devise and develop processes that detect molecular change, and to apply these technologies to, for example, disease prediction and detection or overt and covert authentication devices (anti-counterfeit systems).

Polymeric Materials

Theme Goal: To design and make high-performance polymeric materials to perform specific functions, e.g. drug delivery, personal care products, coatings, inks, polymer electronics, composite aircraft parts, nanocomposites.

Telecommunications & Industrial Physics

Chief: Gerry Haddad

(a) Strategic Position

CSIRO Telecommunications and Industrial Physics uses its broad science and technology base to transform and build capability in Australian communications, manufacturing and service industries. Our activities range from high-performance mobile communications, to designing new molecular electronics and maintaining Australia's international measurement standards.

CTIP technology is being developed for the next generation of orbiting optical observatories, laptop modems, printing presses, Australia's high speed data networks, and automotive components.

(b) Research Themes

Product Innovation

Theme Goal: Improve the diversity and competitiveness of the Australian manufacturing industry by introducing revolutionary new or improved products based on nanotechnology, self-assembling, self-repairing and intelligent systems, molecular electronics.

New Materials and Devices

Theme Goal: Improve the competitiveness of the Australian manufacturing industry by introducing revolutionary new or improved processes for manufacturing, monitoring and control in the transport, food, automotive, biomedical and other industries.

Energy and Sustainability

Theme Goal: Develop new energy systems which result in either incremental or disruptive changes to the economics of fuel production, storage and utilization.

National Measurement Laboratory

Theme Goal: To develop and maintain Australia's national standards of measurement and to provide calibration services in terms of those standards that satisfy the needs of Australia's industry, trade, commerce and defence.

Textile and Fibre Technology

Chief: Brett Bateup

(a) Strategic Position

CSIRO Textile and Fibre Technology (CTFT) provides social and economic benefits to Australia through technological innovation that supports Australia's fibre producing and processing industries. Research areas focus on product and process developments that lead to increased consumer demand, increased processing efficiencies and reduced environmental threats across the whole value chain.

CTFT has the world's largest multifibre research capability and is the home of the Centres of Excellence for Advanced Wool Products and Technical Textiles. Its capabilities include a wide range of multidisciplinary skills capable of servicing wool, cotton, technical textiles and leather at national and international levels.

(b) Research Themes

Increasing global consumer demand for Australian wool

Theme Goal: To provide long term benefit to the Australian wool industry through implementation of research, development and innovation of new products and sustainable processes.

Higher quality Australian cotton

Theme Goal: To improve the sustainability and quality image of Australian cotton in the international market place through fibre metrology and textile processing research

Advanced Textile Developments

Theme Goal: To create new business activity in Australia through the development of high value added technological products for the local and global textile industry.

Assisting Australian Small to Medium Size Enterprises.

Theme Goal: To enhance the export capabilities of Australian small to medium size textile enterprises through the provision of unique fee-for-service activities

Information and Communications Technology (ICT) Research Centre - Major Cross-Divisional Program

(a) Strategic Position

The Centre's mission is to:

Power Australia in the global ICT-enabled services competition:

- making Australia a world-class player rather than a paying spectator.

The Centre will be a whole-of-CSIRO focal point for internationally competitive ICT research. Its primary objectives are to:

- Build a sustainable world-class ICT R&D Centre in a way that increases the amount and quality of ICT R&D in Australia,
- Use ICT R&D to enhance the competitiveness of Australian-based industries,
- Use ICT R&D to achieve cost-effective, differentiating impact on nationally important projects and on CSIRO's research activities as a whole.

(b) Research Themes

Wireless Futures

Theme Goal: Deliver new wireless products and services for increase economic efficiency, improve national security and enhance sustainability.

High-Performance Networks

Theme Goal: Working with information-intensive applications areas (such as entertainment, education) to deliver with new network architectures, features, products and services that enable economic efficiency and enhanced sustainability.

Information Superiority

Theme Goal: Develop new tools, methods, architectures and products that allow people to effectively manage, query, analyse and refine information from multiple sources and to navigate and deliver information that improves decision-making anywhere and anytime.

Patient Centric Healthcare

Theme Goal: Ensuring the right treatment to each patient, specialized to each individual's context and situation.

Remote Healthcare Delivery

Theme Goal: Delivering healthcare where patients and providers need not be in the same place at the same time

e-Science

Theme Goal: Enabling major scientific endeavours by using novel computing, communications, information systems and future knowledge services.

Note: These themes will be subject to further review and development following the appointment of the ICT Centre Director.

Secure Australia – Major Cross-Divisional Program

(a) Strategic Position

Security, by which we mean measures to protect Australia - including its people, livestock, plants, environment, food, water and infrastructure - from harm, has always been an important aspect of CSIRO's work. Our focus is in the civilian domain. The majority of the investment has been in the area of protection from pests, weeds, and diseases – closely aligned with the National Research Priorities. Defence related technologies are not a focus of CSIRO although some of our research areas (e.g. imaging systems, sub-surface radar) could have defence applications.

We are seeking to enhance our capability in the Safe Australia area via greater coordination and facilitation of our existing research capacity and investment, and looking at new opportunities and ways of collaborating with other agencies working in this area via this cross Divisional program.

Through coordination and focusing of capabilities in CSIRO and in partnership with other agencies (particularly DSTO), we shall provide scientific and technological solutions, conceptual frameworks and policy advice to enhance Australia's security. Key capabilities include biosecurity science (diagnostics, control technologies, biotechnology, risk analysis), design of detection, sensing and security devices, information management and security, material science and engineering, and remote sensing.

The main markets to be targeted are government agencies with responsibility for national security policy and operation, importers requiring more efficient and effective screening of cargo, agricultural industries, public and private organisations responsible for critical infrastructure, defence and security technology companies, and major US initiatives delivering science, engineering and technology for national security.

(b) Themes for Secure Australia

The Secure Australia Program is currently under development and the following themes should be considered as indicative only.

Animal and Human Biosecurity

Theme Goal: Provide high quality, rapid diagnosis of diseases of livestock to maintain our disease free status and expand our access to national and international markets for livestock products while also developing new diagnostic tests and surveillance strategies for exotic livestock diseases. Reduce harm to humans from zoonotic and other diseases.

Plant Biosecurity

Theme Goal: Provide new technologies for the rapid, effective detection and identification of exotic organisms at the border or new incursions, eradication or control of plant pests and diseases, and risk analysis frameworks for government policy development.

Critical Infrastructure Protection

Theme Goal: Development of threat detection technologies, materials and design protocols for resilient infrastructure and risk-analysis modelling systems which permit the protection and damage minimization of anthropogenic and natural dangers to critical civilian infrastructures.

Detection and Sensing

Theme Goal: Improving first-line-of-defence detection technologies that can be used to better determine concealed objects on people, illegal items in luggage or shipping containers, articles behind walls, illicit communications submerged items in our oceans and sensors for gases, drugs and explosives.

Information Management and Analysis

Theme Goal: Develop new technologies to ensure that Australia can build and manage secure, adaptable, and integrated information systems to better safeguard Australia from terrorism, crime, invasive diseases and pests, and failure of critical infrastructure. These systems would enable improved planning, intelligence gathering and analysis, resource deployment, and communication to stakeholders.

Counterterrorism and Crime

Theme Goal: Improving capabilities to detect, minimise the impact, respond and recover from criminal and terrorist activity through new technologies for personal identification, information protection, anti-counterfeiting, new analytical technologies for data mining, decontamination and forensic science.

Square Kilometre Array (SKA) and Low Frequency Array (LOFAR) – Major Cross-Divisional Program

(a) Strategic Position

Play a key role in SKA, LOFAR, and next-generation Deep Space Network (DSN) so that they are located in Australia to deliver front-line astrophysical science, develop international linkages and contracts for Australian industry, showcase Australia internationally as a high-tech and innovative nation, and grow Australia's position in global science and technology.

(b) Research Themes

SKA and LOFAR technology development

Theme Goal: Play a key role in technology development for SKA and LOFAR (including ICT, high-bandwidth communications in regional Australia, energy generation in remote areas, desert knowledge, high reliability operation in remote areas, etc.). To become the host for LOFAR and SKA.

Deep Space Navigation Systems Design

Theme Goal: Work on design study and prototype contracts with NASA to facilitate the construction of a \$4 billion next-generation DSN station in Australia.

Sustainable Minerals and Energy Group

Group Chair: Rod Hill

(a) Overview

The mission of the SME Group is to create sustainable value from Australia's mineral and energy resource base. It will engage with industry and other research and commercial partners, where appropriate, for the delivery of clean and competitive ores, minerals, metals, energy and energy systems to the Australian and international market.

The Sustainable Minerals and Energy Group includes the following Divisions:

- Energy Technology
- Exploration and Mining
- Minerals
- Petroleum Resources

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	SME Group Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities	Increase investment focus and delivery on "An Environmentally Sustainable Australia". Increase investment focus and delivery on "Frontier Technologies for Building and Transforming Australian Industries". Increase investment focus on 'Developing Deep Earth Resources'
1.2 Build critical mass and ensure quality in our core research programs	Participate in Divisional reviews of critical mass and quality. Seriously pursue large joint-ventures / strategic alliances to enhance critical mass and quality
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Participate in Light Metals and Energy Transformed Flagships
1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	Increase focus on Emerging Science initiatives. Contribute to Climate Change Program
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Participate in People Development Programs Actively pursue Federation Fellowships Focus on exciting and rewarding strong performers
2.2 Optimise delivery of all research activities by improving project management	Ensure adherence to PMI
2.3 Build our global recognition for science leadership in our chosen science domains	Undertake rigorous international benchmarking of science capabilities. Provide support for engagement of staff in global scientific activities. Participate effectively in the GMRA
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Support CSIRO's involvement in and commitment to the Australian National Synchrotron

3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Develop new, and improve existing partnerships through CRCs and target key university alliances for growth. Participate in the development of the WA S&I initiative
3.2 Service the needs of government for informed policy setting	Provide valued advice on Energy policy. Contribute to LMAA, EAA and MTSAA
3.3 Enhance communication to raise public and stakeholder excitement and trust in science	Conduct more proactive external communication efforts
3.4 Partner with other agencies to advance Australia's global development contributions	Participate in the Energy and Water initiatives within the GRA
4.2 Structure deeper and more meaningful relationships with large corporations	Participate in the development of customer service teams for large corporates. Explore options for major alliances in Energy and Climate Change
4.3 Accelerate the growth of promising technology-based SMEs	Engage with targeted SMEs for delivery of mineral processing R&D. Continue commercialisation of Qem*Sem. Continue commercialisation of Liquatech. Develop CSIRO/HyVista joint venture.
5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research	Increase capability and application of SEI across the minerals and energy sector. Grow mineral biotechnology multi-Divisional program. Grow process measurement and control activities across disciplines
5.2 Be among the best in governance, OHS&E and performance management processes	Install more robust PMF processes. Increase number of shared operational systems. Improve LTIFR and MTFR statistics. Adhere to Corporate planning cycle
5.3 Adopt a unified approach to dramatically improve service and grow top accounts	Lead several CSTs
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Improve working relationships across Divisions
6.2 Proactively manage patent portfolio to multiply IP-based revenue streams	Actively manage patent and equity portfolios. Protect know-how and IP through strategic negotiation of contract terms. Generate increased revenue from "RIPPERS"
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Increase project pricing based on robust estimates of value/benefit delivered. Reduce subsidy unless strategically justifiable. Eliminate non-strategic investments
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Participate in review of overhead costs and embrace actions arising there from

Energy Technology

Chief: Adrian Williams

(a) Strategic Position

The Division aims to drive Australia's sustainable energy future through scientific excellence and innovation. The following recommendations of an external review of all energy activities across CSIRO have been accepted and form the basis of the Division's strategy over the next 5 years:

- Endorsed our activities in clean coal technologies and recommended that CSIRO should act as a catalyst for the development of clean coal technologies leading to the construction of zero emissions coal fired power generators in Australia.
- Continue to pursue opportunities in renewable energy technologies.
- Increase the level of appropriation funding to accelerate the development of core competencies in internationally important emerging energy technologies and systems – particularly distributed energy, new generation transport and energy end use efficiency.
- The Energy Transformed Flagship Program should encompass the predominant pathways to energy sustainability encompassing zero emissions power generation from coal and a range of cost effective/low emission emerging energy technologies.
- The Newcastle Energy Centre is critically important to the success of the CSIRO energy plan and the Flagship Program and must be appropriately supported.
- Consideration should be given to allocating an increased proportion of CSIRO's appropriation to the energy domain.
- CSIRO should play a catalytic role in assisting government to develop and implement public policy instruments for adequately resourcing Australia's energy R&D needs.

(b) Research Themes

Competitive Coal

Theme Goals: Develop the optimum use of a coal resource with regard to economic return and social acceptance in coal preparation, dewatering and value added coal.

Energy Storage

Theme Goals: Develop affordable battery systems for low emission road transportation. Develop battery and control technologies for hybrid energy systems. Establish partnerships for development and production of high performance Lithium and Super-capacitor storage technologies.

Clean air, water, oceans

Theme Goals: Develop solutions to the impact of fine particles, air toxics and greenhouse gas emissions. Develop air pollution control strategies. Provide smart tools for assessing contaminant impacts. Improve energy and mining industry sustainability through understanding contaminant processes from discharges.

Hydrogen Economy

Theme Goals: Develop Establish the scientific foundation and external support for the Hydrogen Centre.

Exploration and Mining

Chief: Neil Phillips

(a) Strategic Position

Australia has wealth and lifestyle beyond the reach of many nations, based largely on the exploitation of our natural resources. The maintenance and enhancement of Australia's wealth will depend on the license-to-operate and global competitiveness of its minerals industry, which will, in turn, rely on the industry's uptake of innovative science and technology.

The mining industry is currently reaping the rewards of past exploration success and a continued supply of quality ore bodies from exploration is vital to the long-term growth of the industry. In recent years, decreasing profit margins in many sectors of the minerals industry have resulted in a corporate focus on business performance, with a resultant decrease in exploration and longer-term research around the world. This decline threatens the long-term viability of the industry and CSIRO Exploration and Mining is positioned to fill this gap and provide science leadership for its future sustainability. It has strong collaborative scientific links with other earth science institutions in Australia. With CSIRO Minerals, it forms a research chain from exploration to mining to mineral processing to metal production and environmental management that is unmatched globally.

CSIRO Exploration and Mining will contribute the necessary science and technologies to meet the challenges ahead for the mineral industry. The size and long-term nature of the Australian mineral industry mean that well-focused research will have enormous payoffs for the nation.

(b) Research Themes

Where to Explore

Theme Goal: Provide data, interpretative tools and terrain scale geological information necessary for effective target area selection for key commodities in Australia.

Recognising Ore Systems

Theme Goal: Provide tools, geological models and criteria to differentiate significant ore deposits from minor occurrences and complex background signatures.

Exploring Through Cover

Theme Goal: Enable the discovery of weathered and/or covered ore deposits in Australia.

Knowing What to Mine (Resources to Reserves)

Theme Goals: Cost-effective tools and strategies to convert Resources to mineable Reserves. Develop enhanced tools for delineating and quantifying ore body quality and grade. Develop systems to quantify all geological uncertainties associated with the conversion of Resources into Reserves.

Mine Productivity

Theme Goals Increase the total resources available for mining and treatment. Improve the consistency of output. Improve equipment availability from real time monitoring of mining systems.

Mine Safety

Theme Goals Reduce injuries and fatalities by removing mine workers from hazardous environments. Reduce downtime from work stoppages caused by injuries. Cut medical costs by reducing injuries and fatalities.

Social and Economic Integration (shared with Minerals)

Theme Goals: Alignment of industry with community expectations (licence to operate). Understand and minimise the impacts of mineral and metal production on the environment. Strategies to maximise the social and economic benefits derived from mineral and metal production.

Minerals

Acting Chief: John Rankin

(a) Strategic Position

CSIRO Minerals provides research, development and commercialisation support for the mineral processing industry. The Division's science, engineering and technology skills and infrastructure are applied predominantly to increase the profitability of companies and improve their environmental performance along the value chain from mine products through the production of concentrates, value-added mineral products and 'intermediates', and semi-processed metals and alloys. The focus is on the operational efficiency of individual unit processes, and increasingly on the development of 'whole-of-system' solutions incorporating environmentally and socially friendly technologies that address triple bottom line ('license to operate') issues.

The minerals industry is heavily globalised and very competitive, with negative growth of the R&D market in Australia over the past three years. The major users of research and technology select their suppliers from the world stage and are moving from research on new technology development to the application and improvement of existing technology and issues of industry sustainability. The main justification for R&D expenditure by companies is the generation of increased productivity and lower operating costs from existing infrastructure and resources, and the minimisation of the environmental impact of their operations. The benefits of R&D expenditure must be obvious from the outset and must be implementable over short time-frames.

(b) Research Themes

Adding Value to Ores

Theme Goals: Improve the quality, grade and recovery of mineral commodities.
Develop technologies to process difficult, complex and low grade mineral resources.
Develop new products from mineral resources

Clean, Efficient Processing

Theme Goals: Develop cleaner, more efficient processes for transforming mineral resources into metals. Develop cleaner, more efficient processes for transforming wastes into benign or useful products. Develop cleaner, more efficient processes for recycling metals and other materials.

Process Design and Control

Theme Goals: Optimise design of reactors for cleaner, more efficient operation. Develop on-line sensing and control technologies for cleaner, more efficient operation of processing plants

Social and Economic Integration (shared with Exploration and Mining)

Theme Goals: Alignment of industry with community expectations (licence to operate). Understand and minimise the environmental impacts of mineral and metal production. Strategies to maximise the social and economic benefits derived from mineral and metal production

Petroleum Resources

Chief: Beverley Ronalds

(a) Strategic Position

CSIRO Petroleum provides research capabilities and technology directed at maintaining an internationally competitive and sustainable Australian oil and gas industry. CSIRO has established itself as the major Australian R&D provider addressing Australian priorities, but operating on a global stage. The Division has strategic relationships with national and international research groups and with service and operating companies. Customers include Australian and multi-national E&P companies, service companies and national oil companies. Multidisciplinary skills in geology, geophysics, mathematical modelling, geomechanics and petroleum/production/chemical engineering are applied to improving exploration, and appraisal performance, reducing costs with innovative technology, minimising the industry impact on environment and maximising the value to Australia from its oil and gas resources. The Division intends to create an Asia Pacific technology hub and network as the focus for the technology development critical to the oil and gas industry.

(b) Research Themes

Reducing Exploration Risk

Theme Goals: Improved exploration models through the development of new exploration technologies. Integration of geological modeling with petroleum systems analysis.

Improved Field Development and Production Performance

Theme Goals: New technologies to improve the quality of reservoir appraisal and the efficiency of field development. Development of new development and production technologies through improved operational performance and cost reduction. Decision making under conditions of uncertainty.

Gas to Liquids (complements work in CSIRO Energy Technology)

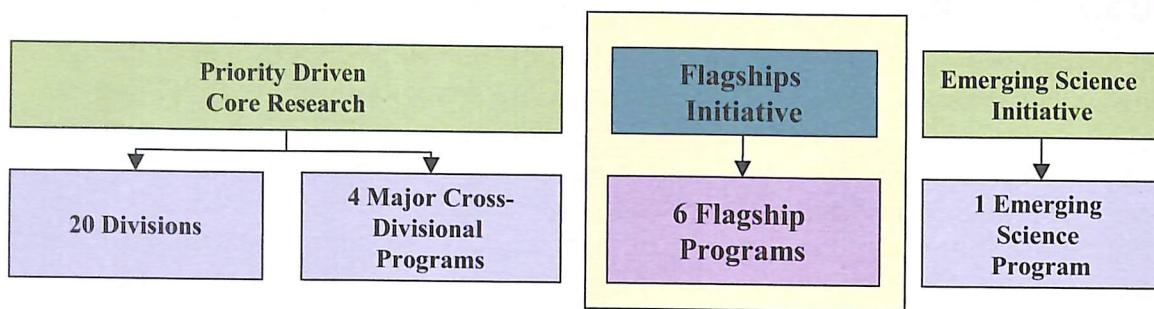
Theme Goals: More efficient processes for the conversion of natural gas to liquids.

Environmental Impacts

Theme Goals: Develop environmentally sustainable drilling fluid and waste management technologies. Geological sequestration of CO₂. Decision making under conditions of uncertainty.

FLAGSHIP PROGRAMS INITIATIVE

Chair, Flagship Oversight Committee: Ron Sandland



(a) Nature and Purpose

The Flagships are partnerships of CSIRO, other leading Australian scientists, research institutions, Government agencies, commercial companies and selected international partners that aim to make a sustained contribution to our economic and social growth and sustainability. They focus CSIRO's and its partners' research efforts and resources on issues of longer-term national importance, closely aligned with the National Research Priorities.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	Flagship Programs Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities (NRPs)	There is strong alignment between Flagships and the NRPs. In 9 of the 17 priority goal areas at least one Flagship has a major objective that is strongly aligned with the priority goal and in another 3 priority goal areas at least one Flagship has a significant objective that is strongly aligned.
1.2 Build critical mass and ensure quality in our core research programs	The Flagships initiative has been developed and resourced in part to build critical mass and ensure quality in our core research programs. The aim is for between 30-40% of CSIRO's appropriation resources to be dedicated to Flagships within 5 years.
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	The Flagships are focused on improving Australians' quality of life and on industry support and development. For example, the Preventative Health Flagship aims to help Australians live longer, healthier lives; while the Light Metals Flagship aims to double export income from light metals while at the same time reducing the industry's environmental impact.
1.4 Increase the impact of major cross-Divisional activities through a focused strategic investment process	The Flagships represent one-CSIRO in action. The combination of multidisciplinary science with scale and a strategic investment process focused on the nation's major challenges and opportunities is designed specifically to ensure that the initiative has substantial impact.
2.3 Build our global recognition for science leadership in our chosen science domains	One of the imperatives of the Flagships initiative is to focus transformational science on major challenges and opportunities confronting Australia. The Flagship Oversight Committee (FOC) has an explicit role in maintaining the high quality of science performed in the Flagships

3.1 Focus and intensify collaboration with universities, CRCs and other agencies	The Flagships are being developed as one-Australia partnerships of CSIRO, other leading Australian scientists, research institutions, Government agencies, commercial companies and selected international partners.
3.2 Service the needs of government for informed policy setting	As the Flagships are focused largely on areas of identified National Research Priority, it is inevitable that they will make a substantial contribution to informed policy setting by government.
6.2 Proactively manage patent portfolio to multiply IP-based revenue streams	Parts of Flagships initiative focused on developing IP as a longer-term path to revenue growth

(c) Governance

A Flagship Oversight Committee is responsible for governance of the Flagships initiative. Chaired by the Deputy Chief Executive, the Committee meets four times a year to:

- consider Flagship business plans and decide on ongoing and prospective resource allocations to the Flagships
- ensure that the Flagships research portfolio is appropriately balanced and aligned with the Organisation's strategic research priorities
- ensure that research performed in the Flagships remains of the highest quality
- review the performance of the Flagships against annual performance plans and project management criteria.

Other members of the Committee include: a Group Chair, the Executive Director Science Planning, the Executive Director Business Development and Commercialisation, the Executive Director Corporate Operations, and the General Manager Flagships Implementation.

(d) Key Objectives

The Flagships initiative aims to deliver scientific solutions to advance six of Australia's most important national objectives, in ways that are consistent with the Government's National Research Priorities:

- strong, sustained growth, new industries, competitive enterprises and quality jobs
- healthier, more productive lives for Australians
- clean, cost-efficient energy
- more productive and sustainable use of water
- the generation of sustainable wealth from our oceans
- growth and prosperity for regional Australia.

During 2003-04 the Flagships initiative will centre on developing and implementing six Flagship Programs: Preventative Health; Light Metals; Energy Transformed; Healthy Country; Wealth from Oceans; and Agrifood Top 5.

Preventative Health

Flagship Director: Richard Head

(a) Overview

Flagship vision: To help Australians to live longer, healthier lives through early diagnosis and prevention.

The Flagship's objective is to work in partnership to realise the enormous potential for reducing the incidence and severity of chronic diseases.

The partnership will:

- develop new foods and diets which combat disease and promote well-being
- develop new ways to identify disease before it becomes serious
- use genes and proteins to predict and prevent ill-health
- develop powerful new tools to analyse the causes of disease and ill-health
- develop better ways to measure and monitor the nation's health and key health issues

The Preventative Health Flagship will be fully operational in 2003-04.

(b) Research Themes

Colorectal Cancer

Theme Goal: Reduce colorectal cancer incidence by 10% and increase 5-year survival from around 63% to 70% by 2020

Cardiovascular Disease

Theme Goal: Reduce the prevalence of individuals with elevated cardiovascular risk factors by 2020

Inflammatory Disease

Theme Goal: Reduce the prevalence of specific inflammatory diseases in the Australian population

Neurodegenerative Disease

Theme Goal: With Neurosciences Australia provide technology platforms to identify new preventative approaches to neurodegenerative disorders

Environment and health

Theme Goal: (1) To identify the five key health related environmentally mediated issues in Australia by 2004 and (2) to identify new preventative strategies

Leading the Light Metals Age

Flagship Director: Tony Filmer

(a) Overview

Flagship Vision: To lead a global revolution in light metals, doubling export income while reducing environmental impact.

The Light Metals Flagship will help:

- double the economic value of Australian light metal production to \$10 billion by 2010
- cut by one third the energy needed to make light metals
- develop novel manufacturing systems for light metals and alloy products
- develop technology to create a new titanium metal industry
- cut the life-cycle environmental impact of light metal products by half

The Flagship will also help catalyse a specialist export cluster in light metals processing, products, technology and related services.

The Light Metals Flagship is expected to become fully operational during 2003-04.

(b) Research Themes

Alumina

Theme Goal: Building on Australia's bauxite resources to grow the share of global alumina production to 50% by 2012

Aluminium Metal Production

Theme Goal: Reduce the global greenhouse impact (CO₂ equivalent) by 10% whilst improving cost effectiveness by 2012

Magnesium Metal Production

Theme Goal: Growth of first cost quartile Australian magnesium industry to 200kt pa by 2012

Magnesium/Aluminium Fabrication

Theme Goal: Robust and growing Australian semi-fabricated and component industry as evidenced by 20% of magnesium production consumed locally by 2012

Titanium

Theme Goal: Creation of a world scale (20kt pa) titanium industry based on continuous processing and integrated with downstream manufacturing in Australia by 2012

Healthy Country

Flagship Director: Colin Creighton

Chief Scientist: Chris Moran

(a) Overview

Flagship Vision: A tenfold increase in the social, economic and environmental benefits from water use by 2025.

Healthy Country will form public and private partnerships that demonstrate how water can be used to return its highest environmental, economic and societal benefits. We will do this by designing and demonstrating the necessary landscape and cityscape systems including profitable conversion of wastes to resources.

The Flagship provides Australia with a vehicle to meet private and public demands for sustainable systems solutions – and to prosper from doing so. It aims to demonstrate: urban and rural water use systems that cope with population growth, increased demand, climate variability and climate change (underpinning continued progress in water management reforms and providing the science to support wise industry, community and government investments)

- participation in adaptive management of our landscapes, so that our unique Australian environment delivers increased profit and better environmental outcomes including flood and drought resistance, healthy rivers and estuaries and maintenance of biodiversity
- industrial, urban and agricultural recycling systems that profit from innovative conversion of wastes to resources.

Healthy Country aims to underpin existing major national policy agendas including the Environmental Industries Action Agenda, National Action Plan for Salinity and Water Quality, Natural Heritage Trust and the Council of Australian Governments water reforms process. Further, we will deliver outcomes to assist the development of the next phase of these policies.

The Healthy Country Flagship will be fully operational from July 2003 and roll out projects across its themes with its partners as 2003-04 progresses.

(b) Research Themes

Rural Irrigation Systems

Theme Goal: To increase the water available to enable equitable and agreed benefits - through smart, efficient and productive water use and allocation.

Urban Water Systems

Theme Goal: To reduce the per capita cost delivery of sufficient water in a condition acceptable to all users using supply, reuse and demand management technologies and innovations.

Rain Fed Systems

Theme Goal: To more effectively gain benefits from the use of the water that supports commodity production and the terrestrial and aquatic ecosystems by designing, protecting and profiting from sustainable landscapes.

Agrifood Top 5

Interim Flagship Director: Allan Green

(a) Overview

Flagship Vision: To transform the international competitiveness and add \$3 billion of value to Australian agrifood.

Agrifood Top 5 will develop innovative agrifoods and processing technologies to help generate a major increase in wealth and sustainability for Australia's agribusiness sector and revitalise the rural and regional economy. It will do this by:

- developing frontier science and technologies with potential to transform the agrifood sector through broad application across its component industries
- applying these technologies to Australia's largest and fastest growing agrifood industries
- focusing their application at key leverage points in the supply chain where success can unlock substantial value
- demonstrating by example their transformational impact by initially concentrating on five key 'hot spot' applications.

Agrifood Top 5 was approved for funding by the Flagship Oversight Committee in March 2003 and will be fully operational in 2003-04.

(b) Research Themes

Advanced Genetics

Theme Goal: To apply advanced genetics to create differentiated grain products that increase the value of Australia's grain production by \$400M for wheat and by \$150M for canola by 2013

Breed Engineering

Theme Goal: To apply breed engineering to boost the product value of Australia's animal-based food industries by \$350M for beef and by \$550M for seafood by 2013

Separation Technologies

Theme Goal: To apply novel separation technologies to create a new Australian bioactive industry generating \$250M in sales of bioactives to the global functional food market by 2013

Non-thermal Processing

Theme Goal: To apply non-thermal processing to create a new Australian industry generating \$350M sales of 'preserved-fresh' foods for global convenience markets by 2013

Advanced Sensory Technologies

Theme Goal: To apply advanced sensory technology to match and monitor products for consumer appeal, and improve the competitiveness of the wine industry generating \$750M in sales of wines developed using this technology by 2013

Wealth from Oceans

Interim Flagship Director: Tony Haymet

(a) Overview

Flagship Vision: To generate sustainable wealth from our marine resources, thereby underlining our sovereignty over our large ocean territories.

Wealth from Oceans will:

- explore for new resources in Australia's vast ocean territory
- develop and use novel exploration technologies and transformational defence technologies
- assist existing marine industries to grow with increased certainty about access to resources and better knowledge of the operating environment
- increase the productivity of terrestrial industries by adapting to climate change and predicting and managing drought/flood cycles
- discover and exploit new petroleum, mineral and living resources from the seas.

The Flagship will form the core of an industry cluster in exports of marine products, know-how and technology, designed to continue the development of sustainable marine tourism, renewable energy and marine environmental services.

The Flagship is still under development. The overview and themes reflect the agreed scope of the Flagship as at the beginning of 2003-04.

(b) Research Themes

Forecasting Ocean Behaviour

Theme Goal: To provide ocean predictions required to increase the efficiency, reduce the risk, and ensure the sustainability of Australia's marine industries, adding \$500M of value by 2013 and enhancing the safety of Australia's people and environment.

Forecasting Ecosystem Response

Theme Goal: To predict the response of Australia's marine ecosystems and fisheries to natural and human drivers, enhancing the sustainability and increasing the value of the nation's marine living resources by \$125M p.a. by 2013.

Forecasting Marine and Terrestrial Impacts

Theme Goal: To develop and apply ocean-based seasonal climate forecasts to increase the sustainable value of Australia's climate-sensitive industries by \$300M p.a. by 2013 and predict the marine impacts of climate change.

Energy Transformed

Flagship Director: John Wright

(a) Overview

Flagship Vision: To position Australia as a world leader in clean, cost-efficient, reliable and secure energy supply and use.

Energy Transformed will develop:

- efficient, zero-emission coal-fired power leading to large scale hydrogen production from fossil fuels
- the world's highest urban air quality through the eventual use of hydrogen as an energy carrier.

The Flagship will form the core of an industry export cluster in clean, efficient energy.

The Flagship is still under development. The overview and theme reflect the agreed scope of the Flagship as at the beginning of 2003-04. However, the scope of the Flagship is expected to be further developed during the financial year in areas such as low emission transport and distributed power generation.

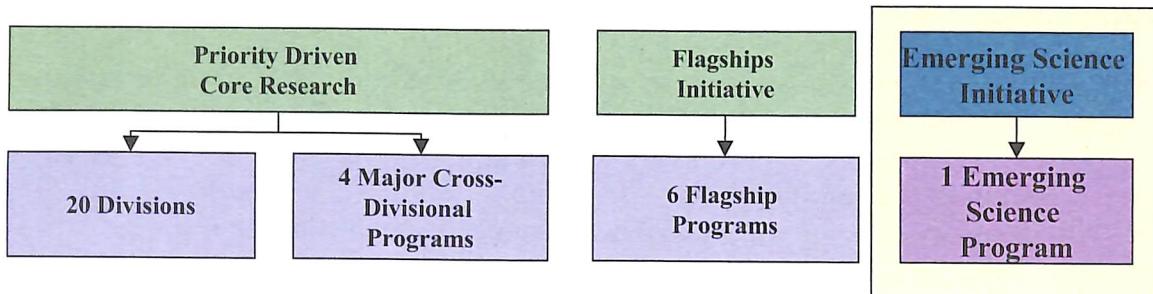
(b) Research Theme

Competitive, Low Emissions Electricity

Theme Goal: To sustain Australia's advantage in competitively-priced electricity supply while efficiently reducing emissions from current and future generation to contribute equitably to Australia meeting its international greenhouse gas abatement commitments

EMERGING SCIENCE INITIATIVE

Chair, Emerging Sciences Oversight Committee: Michael Barber



(a) Nature and Purpose

The Emerging Science initiative has been established to catalyse investments in breakthrough science that will:

- initiate or accelerate growth in emerging areas of critical science capability in CSIRO;
- contribute towards the frontier technologies that will underpin CSIRO's long-term strategic portfolio;
- enhance CSIRO's reputation for scientific excellence; and
- strengthen CSIRO's linkage with international science.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	Emerging Science Activity
1.1 Play a significant role in delivering on Australia's National Research Priorities	Support CSIRO's Implementation Plan particularly with respect to meeting the goal of breakthrough science underpinning frontier technologies for building transforming Australian industry.
1.2 Build critical mass and ensure quality in our core research programs	Contribute towards the development of capability in the identified themes of emerging scientific.
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Encourage CSIRO scientists to engage with the leading edge of world science.
2.3 Build our global recognition for science leadership in our chosen science domains	Build CSIRO's reputation in the select themes of emerging science
5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research	Ensure that the identified themes integrate as strongly as possible across the organisation

(c) Governance

The key elements of the governance of the Emerging Science Initiatives are: the Executive Director Science Planning (who has executive responsibility and accountability), the Emerging Sciences Oversight Committee (ESOC), and Theme Leaders and Theme Advisory Boards.

Roles of the ESOC include advising the Executive Director Science Planning with regard to the identification of emerging science themes and deliverables; the approval of emerging science plans and budgets; the oversight of theme performance; and the facilitation of linkages with other Divisional activities.

Theme Leaders are responsible for developing, with appropriate advice, the business plan and the annual operational plan for the theme; for strategic and operational management (including the development of projects); for establishing effective linkages and relationships with relevant internal and external groups; for ensuring science excellence; and for the administrative and financial management of theme activities.

Theme Advisory Boards include a number of external representatives selected for their distinction and relevance to the activities of the theme. The primary functions of the advisory boards are to give strategic advice to the theme leader; to ensure significant external input into the development and selection of the streams and/or projects that deliver the theme goals; to oversee regular assessments of theme activities and quality of outputs; and to facilitate engagement with relevant agencies and research groups in Australia and internationally.

(d) Key Objectives for 2003-04

- Fully implement the governance arrangements and the performance management framework across all themes;
- Improve visibility and transparency of ESI themes and their activities within CSIRO;
- Establish an effective nanotechnology theme;
- Develop effective linkages between ESI themes and relevant Flagship and Core Divisional Activities and with BD&C;
- Appoint a theme leader for SEI and establish the SEI theme as a key element in the engagement of CSIRO with the wider social sciences community as part of CSIRO's obligations in implementing the National Research Priorities.

(e) Emerging Science Themes

For 2003-04 the emerging science initiative consists of the following five themes.

Complex Systems Science

Theme Goal: Exploring systems whose behaviour cannot be understood or predicted from the characteristics of their component parts and/or whose behaviour ‘emerges’ in a collective way through the local action of ‘players’ using local knowledge.

Socio-Economic Integration

Theme Goal: Enhancing CSIRO’s ability to put together integrated teams whose members span the spectrum of social science and biophysical skills necessary to address some of the most complex problems facing society.

Novel Biotechnologies

Theme Goal: Initially, in the context of CSIRO’s wider biotechnology strategy, focus on the development of skills and capability in the key frontier sciences of genomics and bioinformatics.

Nanotechnology

Theme Goal: Ensuring that CSIRO has the requisite skills and experience to exploit what has been described as the third great enabling technology of the 21st Century after biotechnology and information technology.

Innovative Information and Communication Technologies

Theme Goal: The current focus is on the frontier technologies of grid computing, telecollaboration and ‘smart spaces’ – systems of embedded, communicating devices.

2.2 Science Planning

Executive Director Science Planning: Michael Barber

(a) Research Selection

Science Planning is undertaken to ensure that the core competence of CSIRO – its science base - will achieve focus, impact and scale, and is capable of meeting the requirements of its customers and stakeholders. The Executive Directorship of Science Planning has primary strategic responsibility for this activity. It is a “lean” unit and works closely with the Executive Director Business Development and Commercialisation and the four Group Chairs.

The Executive Director Science Planning examines inputs from sources such as:

- the Government’s National Research Priorities,
- the organisation’s strategic plan,
- feedback from Sector Advisory Councils,
- developments in emerging and breakthrough science,
- market analysis; and
- opportunities for collaborative research

to develop an overarching plan for the organisation’s research portfolio.

Another important input to the organisation’s science planning process come from the CSIRO Science Forum. The Forum is designed to enhance our commitment to the conduct of excellent science by assisting activities that foster science excellence, sharing better practice and as a mechanism for gaining input from scientists into strategic direction. The Forum has members drawn from all Divisions and levels of the organisation.

The key strategic initiatives are increasing investments in appropriate areas of both emerging and nationally important science and technology, enhancing national and international awareness and collaboration, developing performance metrics and programs, and strengthening ties with Australian universities within the context of the National Innovation System and the postgraduate and postdoctoral award schemes.

Science Planning’s themes reflect five intersecting responsibilities:

- Science policy and planning
- Science advocacy and ambassadorship
- Science excellence and assessment
- Science talent management
- Relationship building and partnerships

(b) Alignment with CSIRO’s Strategic Plan

Strategic Plan Objective	Science Planning Activity
1.1 Play a significant role in delivering on Australia’s National Research Priorities	Science Planning is responsible for the NRP implementation plan and for reporting to the government on implementation.
1.2 Build critical mass and ensure quality in our core research programs	Develop and monitor metrics to measure quality and concentration.

2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Coordinate and oversee the central CSIRO Post-graduate and Post-doctoral programs and the Federation Fellow support scheme and the overseas visitors/fellows program. Monitor the number of Post-docs and post-graduates in the Organisation. Reactivate and redefine the role of CSIRO Science Forum.
2.3 Build our global recognition for science leadership in our chosen science domains	Monitor ISI citation data.
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Establish and maintain links for LOFAR development with WA Office of Science and Innovation.
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Lead CSIRO's engagement with the "collaboration review" and other government reviews aimed at setting the foundation for development of Backing Australia's Ability II. Benchmark CSIRO with international comparitors.
3.2 Service the needs of government for informed policy setting	Lead CSIRO's engagement with DEST and CSIRO's contribution to science policy. Support CSIRO's Government Business unit.
4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries	Establish CSIRO's high performance scientific computing program. Oversee CSIRO's engagement with the Bureau of Meteorology and APAC.
5.1 Stimulate breakthroughs by promoting cross-pollination, especially in frontier research	Improve governance and performance measurement for the Emerging Science Initiative. Develop appropriate metrics to measure and monitor CSIRO's breakthrough science activities.
6.1 Secure greater Federally funded support for CSIRO science investment	Lead CSIRO's science advocacy role on nationally important councils.

(c) Themes for Science Planning

Science Policy and Planning

Theme Goal: Through planning across immediate and longer term needs, ensure that CSIRO's science base is connected with issues relating to national policy in order that the relevance and impact of the organisation is visibly tangible.

Science Advocacy and Ambassadorship

Theme Goal: To communicate CSIRO's scientific successes to a wide audience of stakeholders to ensure that the strategic focus on scale and impact in major programs which address national priorities is endorsed and supported .

Science Excellence and Assessment

Theme Goal: Through unambiguous measurement, international comparison and implementation of strategies that demonstrate our ongoing commitment to our science base, to assess and ensure that the Science Performance in CSIRO continues to improve.

Science Talent Development

Theme Goal: To attract high quality scientists to CSIRO, introduce new skills into the organisation and develop current staff through programs and strategies that strengthen CSIRO's ability to compete for resources from a limited pool.

Relationship Building and Partnership

Theme Goal: Nurture, develop and sustain strong science based relationships with key stakeholder groups, particularly the universities, academies and related international organisations, to ensure that CSIRO's strategic development is facilitated and CSIRO's excellence in science is recognised.

(d) Response to National Research Priorities

The Organisational Implementation plan for the National Research Priorities (NRPs) is produced by Science Planning. The implementation plan is consistent with, and significantly influences, CSIRO's Strategic Plan for the next triennium. Overall, this implementation strategy will increase the impact of CSIRO's research activities by enhancing their focus, increasing their scale and achieving synergies from strong partnerships, and managing performance to optimise the realization and up-take of outcomes.

The *Flagship Program* is the key plank of CSIRO's response to the NRPs. While the concept of the Flagship Program predates the announcement of the Priorities, CSIRO and its partners have reviewed the objectives and planned roll-out of the Program to ensure optimal alignment with the NRPs.

In addition to their individual outcomes relevant to the NRPs, the Flagship Programs are closely interrelated and have a very intimate connection to other critical Government policies and initiatives.

In addition to the six Flagships, CSIRO will respond to NRP goals by refocusing existing Divisional investments in a number of key areas into *Major Cross Divisional Programs*. The intent is to review, integrate and refocus current activities and make (limited) new investment in priority goal areas to achieve impact through scale and enhanced collaboration.

All Divisions, as part of their planning processes, regularly assess developments at the frontier of their particular scientific base and critically evaluate their research portfolio in consultation with relevant stakeholders to include 'options for the future'. The generation of 'breakthrough science for frontier technologies' is also an important element of the Flagship Programs and the Major Cross-Divisional Programs, in particular ICT Reinvention and the creation of the CSIRO ICT Research Centre.

In addition, CSIRO has initiated, and will significantly accelerate over the next triennium, a program—the *Emerging Sciences Initiative*—that involves a number of strategic investments in specific areas of emerging science. Through this initiative CSIRO plans to reallocate in excess of \$45 million dollars over 2003-6 into a number of targeted areas. Funding initially will focus on activities in the fields described under the Emerging Science area of this plan.

In response to the NRPs these investments will be deliberately focused towards the Priority Goals of 'breakthrough science' and 'frontier technologies' and subject to ongoing rigorous

review. As with the Flagship Program the ‘direct investment’ is expected to leverage existing Divisional funding so that ultimately 10-15% of appropriation funding is supporting ‘breakthrough science’ that supports long-term value generation for Australia.

Figure 12 illustrates how the key CSIRO strategies—Flagships, Major Cross-Divisional Programs and Emerging Science—will, over the coming triennium, direct resources and effort into the NRPs. Figure 12 grades the likely impact on the Priority Goals from these initiatives as:

- Central, when the Priority Goal itself is a key objective of the program and substantial investment is planned so that scale is obtained.
- Significant, when the Priority Goal is a lesser objective but still significant and consequently addressing this objective will be a feature of the program. or
- Supplementary or incidental, where there is a reasonable likelihood that the program may contribute outcomes relevant to the indicated Priority Goal but this is not a major focus of the program for which major direct investment is planned.

That there is already a significant alignment between the NRPs and CSIRO’s current research portfolio is consistent with CSIRO’s mandate and the organisation’s historical focus on performing research to benefit Australia. Figure 13 summarises how the twenty research Divisions of CSIRO currently address the priority goals of the four NRPs.

During 2003-04 CSIRO will remain actively engaged in discussion with all the other agencies who are required to develop NRP implementation plans to identify factors and/or practices that inhibit cooperation; and to identify opportunities for future collaboration that would further the Government’s intent.

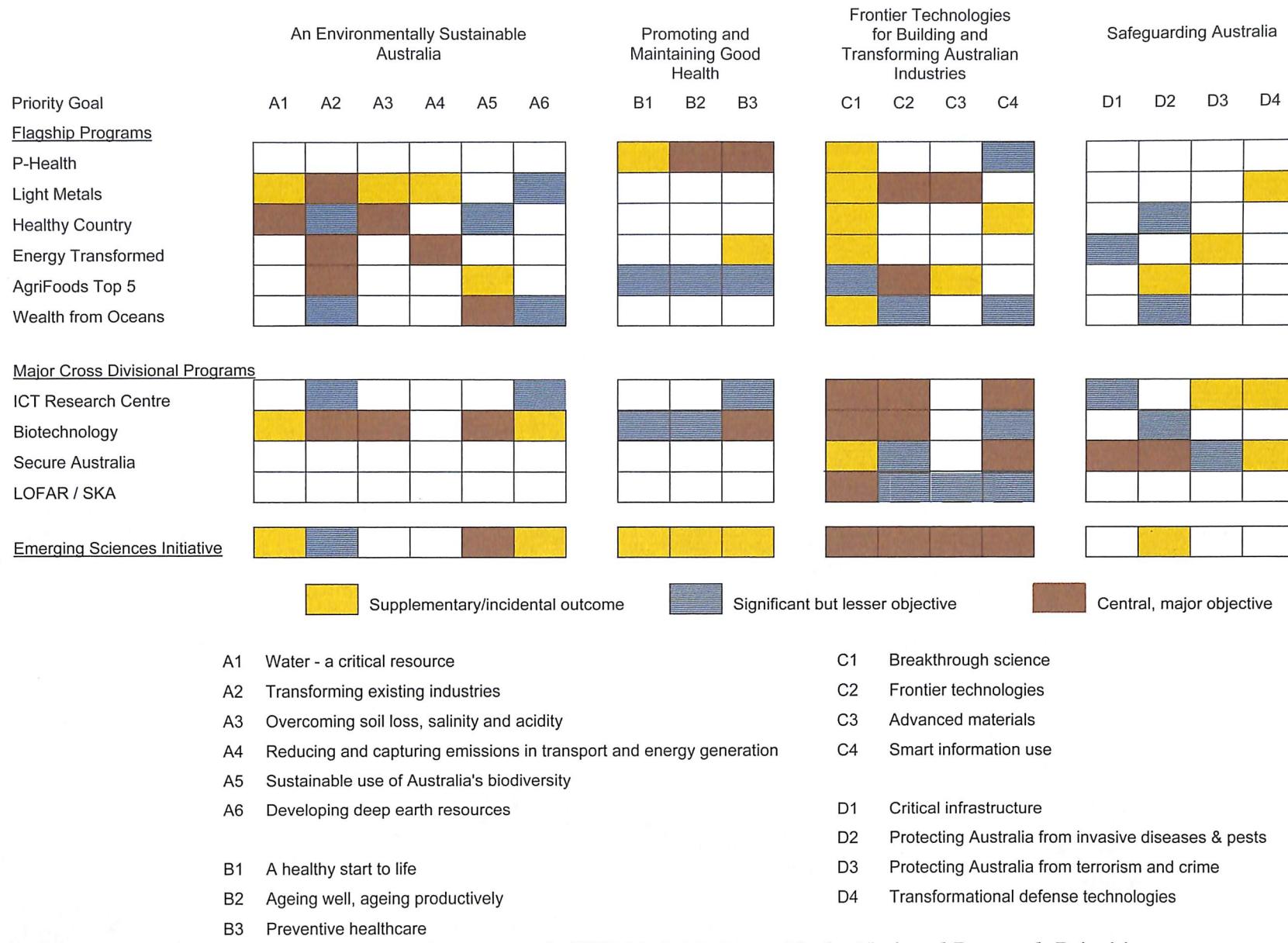
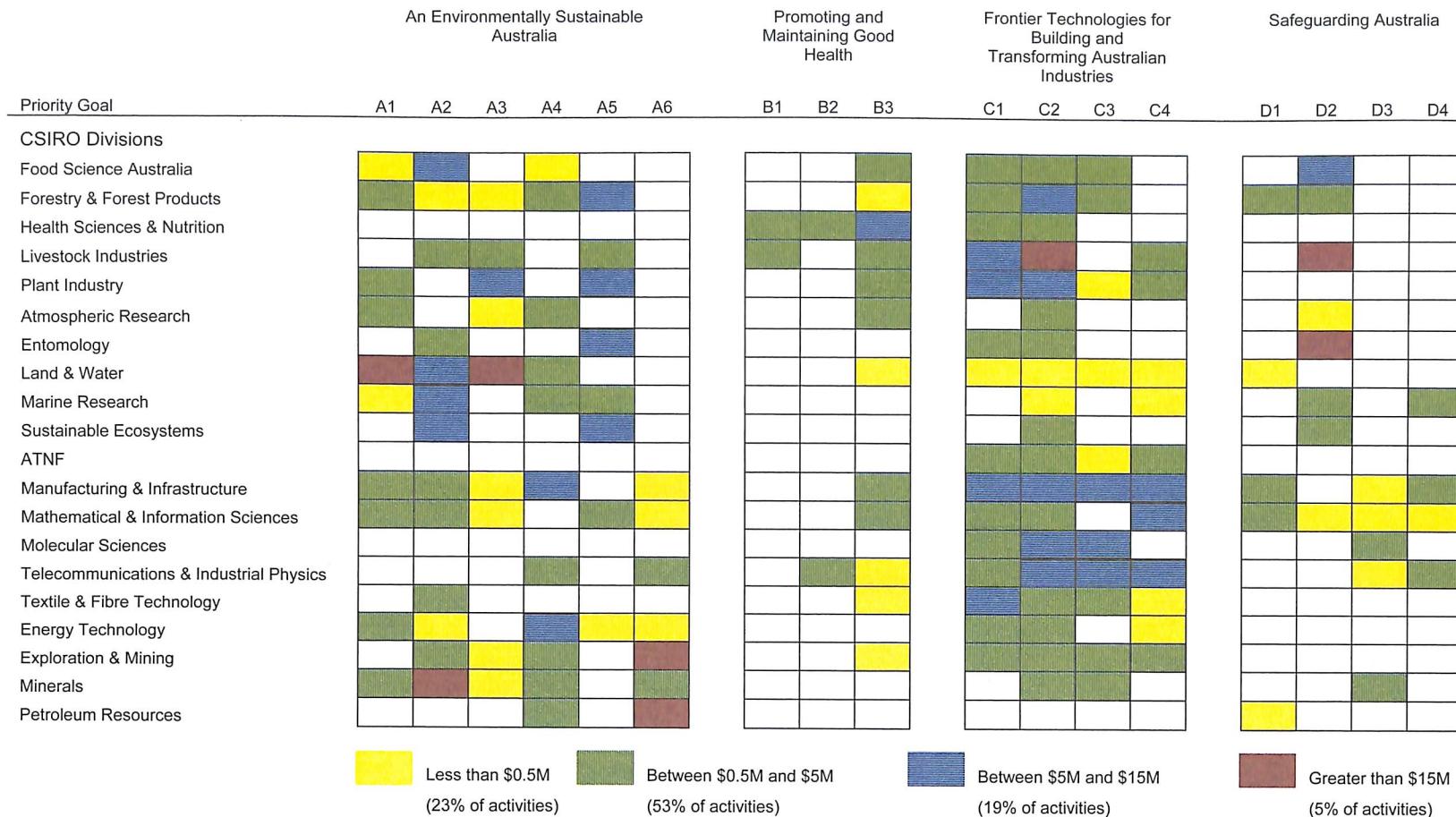


Figure 12: Alignment of the anticipated outcomes of CSIRO's initiatives with the National Research Priorities



- | | | | |
|----|---|----|---|
| A1 | Water - a critical resource | C1 | Breakthrough science |
| A2 | Transforming existing industries | C2 | Frontier technologies |
| A3 | Overcoming soil loss, salinity and acidity | C3 | Advanced materials |
| A4 | Reducing and capturing emissions in transport and energy generation | C4 | Smart information use |
| A5 | Sustainable use of Australia's biodiversity | | |
| A6 | Developing deep earth resources | | |
| | | | |
| B1 | A healthy start to life | D1 | Critical infrastructure |
| B2 | Ageing well, ageing productively | D2 | Protecting Australia from invasive diseases and pests |
| B3 | Preventive healthcare | D3 | Protecting Australia from terrorism and crime |
| | | D4 | Transformational defense technologies |

Figure 13: Alignment of current Divisional Activities with the National Research Priorities

2.3 Business Development & Commercialisation

Executive Director Business Development and Commercialisation: Mehrdad Baghai

The conduct of excellent science on issues of national priority is fundamental to CSIRO's mission, but is not sufficient for delivering real impact and relevance. Generating value for the nation depends upon CSIRO developing strong relationships with potential users and beneficiaries – in both the public and private sectors - and on supporting these relationships with effective and efficient disciplines of technology transfer.

Last year, we increased our investment in the newly formed Business Development and Commercialisation (BD&C) group. We reviewed our processes for the transfer of the Organisation's science, technology and know-how, defined priorities consistent with the emerging strategic directions, and recruited experienced external staff to build stronger organisation-wide capability. The BD&C Group now consists of the Chief of Staff, the Director of Commercialisation, the General Counsel as well as General Managers responsible for various Business Development and Commercialisation streams, Strategic Transactions, and Business Improvement.

In 2003-04, consistent with the Strategic Plan, the focus of the BD&C major program will be on a single aspiration: "*Delivering serious impact and value to Australia through excellence in technology transfer.*" The BD&C Group intends to deliver on this aspiration over the four years of the Strategic Plan. In 2003-2004, the Group will focus on six themes that are described below.

BUSINESS DEVELOPMENT

(a) Overview

There will be a dramatic increase in the nature and level of engagement with our four key customer segments. In the private sector, we will concentrate our efforts on successful large corporations as well as the most promising growth stars within the small and medium enterprise (SME) space in Australia. In the public sector, we will build stronger partnerships with the Rural Industry Research and Development Corporations (RDCs) and State governments to advance "clustering" and will take an active role in paid humanitarian projects with the new Global Research Alliance (GRA.) The Business Development team will target the largest opportunities in these four segments with support from the Divisional Chiefs and staff through active customer service teams (CSTs) that deliver resources from across CSIRO to the client. Smaller (and narrower) client opportunities will continue to be driven by Divisional staff. CST efforts will be reinforced by resources in a few support areas such as marketing communications and the customer value survey (CVS) team.

(b) Alignment with CSIRO's strategic plan

Strategic Plan Objective	BD&C Activity
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Develop world-class BD talent in Divisions as well as in Corporate and attract high-quality affiliates overseas to drive deal flow

3.4 Partner with other agencies to advance Australia's global development contributions	Pursue funding from global foundations and support CSIRO's leadership of the 'water for all' initiative with the GRA.
4.1 Intensify engagement with RDCs to grow regional and new industries	Grow CSIRO's engagement with top 3-5 RDCs and relevant states
4.2 Structure deeper and more meaningful relationships with large corporations	Grow CSIRO's collective engagement with large corporations and multi-national corporations
4.3 Accelerate the growth of promising technology-based SMEs	Identify 'SME stars' and develop growth partnerships including novel 'spin-through' relationships
4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries	Collaborate with leading ICT SMEs in CSIRO Growth Partnership program.
5.3 Adopt a unified approach to improve service dramatically and grow top accounts	Identify and facilitate the active operation of Client Service Teams where the relationship cost is justified
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Revamp the CVS and VIP surveys

(c) Governance

Business Development and Commercialisation activities are undertaken within Divisions on a daily basis under the management of individual Chiefs. This large stream of activity is undertaken in accordance with the governance arrangements articulated in the Organisation's Commercial Practices Manual. Whenever these activities are of significant complexity (e.g., they involve the creation of a separate legal entity or they exceed \$1.5million in value) they are subject to additional review and approval by the Commercialisation Executive Committee, *ComEx*. (see Governance description under Commercialisation below.)

Selection of strategic partnerships is a process that is partly analytical and partly market-driven and opportunistic. Still, common processes for fairness in choosing partners are deployed. For example, in choosing early candidates in the SME space, the awards processes of objective third parties were used. In dealing with multinational companies, consideration is given to balancing the value of working with potential domestic players against the value of partnering with large corporations into Australia. The progress of the top 50 CSTs will be evaluated annually during an Executive Management Council meeting. This will ensure client service resources are invested in the top opportunities.

(d) Goals

The top-line goals for this theme will revolve around delivering at least 10 deep significant relationships with a number of key accounts in each of the targeted four segments. The significance threshold is defined distinctly for each segment. For example, given CSIRO's history, a deep relationship with an RDC might involve commitment of resources closer to \$10 million per annum; while, for a large corporation, \$2 million might represent significant commitment.

COMMERCIALISATION

(a) Overview

There will be a concentrated effort to build an “endowment” for CSIRO by translating our legacy IP into current and future cashflow streams. New venture creation (through spinoffs) and Intellectual Property (IP) licensing (often in partnership) have been the two dominant strategies for CSIRO in this commercialisation arena. The Commercialisation team reviews the deal pipelines of Divisions and case manages the most complex or valuable through the ComEx transaction approval process with an emphasis on working with Divisional staff to shape and close transactions. It will drive opportunities to realise value from the patent portfolio, especially those promising returns in excess of \$10 million. It will also take lead responsibility for the management of CSIRO’s shareholdings in spinoffs with an eye to generating additional financial capacity through smart exits.

(b) Alignment with CSIRO’s strategic plan

Strategic Plan Objective	BD&C Activity
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Develop world-class Commercialisation talent in Divisions as well as in Corporate; develop database of entrepreneurs and advisers
5.2 Be among the best in governance, OHS&E and performance management processes	Raise effectiveness of new governance processes through continuous improvement
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Identify and facilitate the design and adoption of best practice business processes including pipeline management
6.2 Proactively manage patent and equity portfolios to multiply IP-based revenue streams	Pursue royalties from RIPPERs (most promising patents) and analysis of remaining IP assets; manage equity portfolio for value realisation

(c) Governance

Business Development and Commercialisation activities are undertaken within Divisions on a daily basis under the management of individual Chiefs. This large stream of activity is undertaken in accordance with the governance arrangements articulated in the Organisation’s Commercial Practices Manual. Whenever these activities are of significant complexity (e.g., they involve the creation of a separate legal entity or they exceed \$1.5million in value) they are subject to additional review and approval by the Commercialisation Executive Committee, *ComEx*.

ComEx is chaired by the Executive Director BD&C with other members including the CFO, one Group Chair and two independent external members. The General Counsel, Chief of Staff and the Director of Commercialisation also attend ComEx meetings. These transactions are ultimately approved under the delegation of the Chief Executive based on recommendations from ComEx. For a subset of ComEx transactions (e.g., they involve the creation of a separate legal entity or they exceed \$5million in value) these matters are further examined by a sub-committee of the Board called the Board Commercial Committee, *BCC*. All matters involving the formation, management and exit from spinoff companies are outlined in a shareholding policy which will be administered by the Director of Commercialisation.

(d) Goals

The top-line goals for this theme will be to surface and refine at least 100 opportunities in the commercialisation pipeline and to deliver 25 or more deals with promising future profit streams.

BUSINESS IMPROVEMENT

(a) Overview

There will be a significant priority placed on raising the business development and commercialisation capabilities of the Divisional staff (especially scientists) while also increasing their ability to work as one-CSIRO. Driven primarily through a focused piloting program in a few selected Divisions, we will re-engineer critical BD&C processes and encourage the broader sharing and adoption of best-practices. A forum for all CSIRO commercial personnel is conducted three times a year by the BD&C Group to facilitate sharing of ideas and adoption of best practice. Specifically, in 2003-2004, we will drive the piloting and roll-out of a contract simplification process which should dramatically reduce the transaction costs of negotiating small contracts. These activities will be led by the Business Improvement team with a strong emphasis on working with scientists and program leaders.

(b) Alignment with CSIRO's strategic plan

Strategic Plan Objective	BD&C Activity
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Develop world-class BD&C talent in Divisions
5.2 Be among the best in governance, OHS&E and performance management processes	Raise effectiveness of new governance processes through continuous improvement of portfolio management within Divisions
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Identify and facilitate the design and adoption of best practice business processes including contract simplification
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Build skills of scientists and develop case studies for teaching core capabilities
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Review value from consolidation of services within Groups

(c) Governance

The work of the Business Improvement teams is jointly sponsored and reviewed by the relevant Division Chiefs and the Executive Director of BD&C. All transactions generated by the team are approved through the normal ComEx approval processes. The financial and legal implications of the business process redesigns are reviewed by the Director of Finance and the General Counsel respectively.

(d) Goals

The top-line goals for this theme will be to complete piloting in 3 more Divisions and to implement contract simplification into at least 10 Divisions. In addition, the skill building of Divisional staff will be another priority.

STRATEGIC TRANSACTIONS

(a) Overview

The BD&C Group will serve an executive and advisory role on behalf of the Chief Executive and the Board on all large and complex strategic transactions of the organisation. These activities include joint ventures and alliances contemplated by Divisions, CSIRO's involvement in global facilities and large umbrella deals with venture capital firms to expedite the spinoff process. These internal investment banking activities will be led by the General Manager, Transactions.

(b) Alignment with CSIRO's strategic plan

Strategic Plan Objective	BD&C Activity
1.2 Build critical mass and ensure quality in our core research programs	Explore joint ventures and alliances to establish scale and breadth of capabilities in science programs
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Assist the team preparing the LOFAR bid for Australia
4.3 Accelerate the growth of promising technology-based SMEs	Negotiate and administer umbrella deals with venture capital firms
4.4 Reinvent our ICT capabilities to strengthen Australia's knowledge-based industries	Consider structural solutions and possible alliances for ICT reinvention
5.2 Be among the best in governance, OHS&E and performance management processes	Raise professionalism and disciplines used by CSIRO in strategic transactions

(c) Governance

The transactions under this theme are jointly sponsored and reviewed by the relevant Division Chiefs and the Executive Director of BD&C. All transactions are approved through the normal ComEx, BCC, Board and Ministerial approval processes.

(d) Goals

The top-line goal for this theme will not be around the number of completed transactions. Quite the contrary, the success measures are around thorough and professional evaluation and negotiation of proposed transactions. Often times, the decision to walk away may in fact be the correct decision. Therefore, the goal is around creating a stronger CSIRO through the pursuit of CSIRO's best interests in strategic transactions and by dramatically raising the professionalism and discipline exercised in the process.

GENERAL COUNSEL

(a) Overview

The BD&C Group executes administrative and governance functions on behalf of the Chief Executive and the Board. The General Counsel will handle the management of key disputes and litigation as well as taking the lead on specific training and development programs for members of the CSIRO Legal Network across all Divisions. In addition, a review of the purchasing of external legal services will be conducted with an objective of leveraging scale across CSIRO to reduce total costs in this area while also increasing the quality of advice.

(b) Alignment with CSIRO's strategic plan

Strategic Plan Objective	BD&C Activity
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Develop world-class legal talent in Divisions as well as in Corporate
5.2 Be among the best in governance, OHS&E and performance management processes	Raise effectiveness of new governance processes through continuous improvement
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Review purchasing of legal services across CSIRO

(c) Governance

The General Counsel serves on ComEx, the BCC and the Audit Committee and is formally wired into the transaction approval processes. Disputes handled by the General Counsel are reported to the Board Commercial Committee on a regular basis. The decision to pursue active litigation on any matter is raised with the Board (and if necessary, the Minister) in advance of that process. The Executive Director of BD&C and the General Counsel seek the Chief Executive's direction on all disputes of monetary or political significance.

(d) Goals

The top-line goals for this theme will revolve around the track record of success in resolving disputes, the increase in capabilities of the members of the Legal Network and the reduction in the cost of external services.

OFFICE OF THE EXECUTIVE DIRECTOR

(a) Overview

In addition to the five core themes of the BD&C Group, the Office of the Executive Director has responsibility for a sixth set of governance and administrative activities on behalf of the Chief Executive and the Board. Internally, the Executive Director and the Chief of Staff manage the transaction approval processes of the Board Commercial Committee (BCC), as well as serving on various committees like the Flagship Oversight Committee. The Office also takes on special roles in coordinating the market strategies of most promising and attractive capability areas that span multiple Divisions, and in sorting out the most thorny and complex commercial problems that are surfaced over time.

Externally, the Office attends Senate Estimates and other parliamentary reviews, and generally works to influence the adoption of sensible innovation and industrial policies.

(b) Alignment with CSIRO's strategic plan

Strategic Plan Objective	BD&C Activity
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Develop world-class BD&C talent in Divisions as well as in Corporate
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Explore collaboration in commercialisation with select universities and CRCs
3.2 Service the needs of government for informed policy setting	Advance thinking about commercialisation and innovation policies in Australia
5.2 Be among the best in governance, OHS&E and performance management processes	Raise effectiveness of new governance processes through continuous improvement
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Review purchasing of consulting services across CSIRO

(c) Governance

The Executive Director of BD&C reports to the Chief Executive and serves on the Executive Team. A full report on the progress of the BD&C team is delivered to the Executive Team as well as the Board Commercial Committee annually. The leaders of the six themes described all participate in monthly meetings as the leadership team of the BD&C group. This forum allows cross-pollination of ideas as well as coordination of efforts with Divisions.

(d) Goals

The top-line goal for this theme is clearly the delivery of impact by the whole BD&C team across all the themes. In addition, another top-line goal is the implementation of the full range of governance systems and processes to the satisfaction of the Board and BCC chairman as well as the Chief Executive.

2.4 Office of the Chief Executive

Chief Executive: Geoff Garrett

Deputy Chief Executive: Ron Sandland

Corporate Secretary: Ted Cain

COMMUNICATION AND OUTREACH

(a) Overview

Corporate communication services currently deliver media management; internal and external communication; government business (ministerial liaison, government relations, policy coordination); enquiries call centre; web development; education and CSIRO publishing.

Divisional communicators provide strong support at the ‘coal face’ to help facilitate key research and business activities. Divisions also engage external communications expertise for a range of knowledge transfer, marketing and public relations activities, primarily to meet Divisional objectives.

The Corporate and Divisional capability together identifies as a communication ‘network’. Divisional communicators are well placed to deliver or translate corporate messages, input to major cross-divisional projects and one-CSIRO objectives. There is a strong desire and need for this network to engage more strategically, drive efficiencies and evolve into a ‘community of practice’.

(b) Alignment with CSIRO’s Strategic Plan

Strategic Plan Objective	Communication and Outreach Activity
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Strategy development and implementation for internal and external stakeholders, launch and event management, publications, outreach.
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	Facilitate consistent approaches to communication in recruitment and induction and manage reputation, education outreach, with strong internal communication for effective staff engagement.
2.3 Build our global recognition for science leadership in our chosen science domains	Reputation and brand management, development of corporate collateral, outreach activities, publishing services, media management, web.
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Events management, development of corporate collateral. Reputation management.
3.2 Service the needs of government for informed policy setting	Foster CSIRO links with federal government departments and agencies to provide effective scientific support for the development of policy and to influence science and innovation policy.
3.3 Enhance communication to raise public and stakeholder excitement and trust in science	- Strategy development and implementation, - Reputation and brand management - Key stakeholder management and customer segmentation - Internal communication and change management

	for staff engagement, - Outreach activities, publishing services, media management, web and national call centre - Event management, exhibitions and Discovery Centre - Development of a professional ‘community of practice’ to support strategic objectives - Measurement and evaluation.
4.2 Structure deeper and more meaningful relationships with large corporations	Support of customer segmentation strategy, marketing.
5.2 Be among the best in governance, OHS&E and performance management processes	Foster a culture that enhances good governance and project management and the safety and well being of staff.
5.3 Adopt a unified approach to dramatically improve service and grow top accounts	Support of customer segmentation strategy, marketing, development of corporate collateral.
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Implementation of a unified web presence.
6.1 Secure greater Federally funded support for CSIRO science investment	Provide effective support for CSIRO’s interactions with ministers, government and parliament – Government Business, Reputation Management, Corporate Communications
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Development of a ‘community of practice’ which will establish panel providers for communication services / rationalise and centralise some services.

(c) Governance

The Director of Communications (to be appointed) will report to the Deputy Chief Executive, Dr Ron Sandland. This will facilitate the development of an integrated change leadership portfolio (comprising Communications, People Development and the Flagship Program). Such a portfolio is an essential prerequisite to progressing the significant change agenda within CSIRO. This arrangement, functioning through the Office of the Chief Executive, will recognise the CEO as the principal internal customer of the communications function and special consideration will be given to eliciting, anticipating and meeting his needs in this domain.

(d) Theme Goal

Build the influence and reputation of CSIRO and of Australian research through active management of our relationships with industry, governments, the Australian community, the education sector, the international scientific community and our staff. (Performance will be assessed by an annual brand audit survey covering the above stakeholders).

PEOPLE MANAGEMENT

(a) Overview

People Management is a critical enabling process that occurs throughout CSIRO at every level. However, a leading responsibility for “People Development” as a strategic initiative is provided by Corporate People Development, which reports to Dr Ron Sandland, in the Office of the Chief Executive (OCE).

The corporate People Development team provides the leadership and direction for the People Development function and ensures integration with other corporate initiatives. Within a framework of effective governance, it engages a highly effective People Development Network, to develop and implement a broad spectrum of strategic initiatives, while also emphasising operational excellence in service delivery. Through active people management, the PD function aims to create and maintain a work environment in which the full potential of our people is realised and directed to the achievement of CSIRO’s objectives.

(b) Alignment with CSIRO’s Strategic Plan

Strategic Plan Objective	People Management Activities
1.3 Champion Flagships to improve the lives of Australians and advance Australia’s key industries	Implement strategies to engage staff and mobilise CSIRO’s people to support Flagships.
2.1 Concentrate people processes on developing, attracting, exciting and retaining talent	<ul style="list-style-type: none"> i) Provide a suite of development opportunities targeting Organisational priorities. ii) Support Group chairs to identify, attract, retain and develop key talent. iii) Embed a culture that promotes personal development aligned with Organisational needs. iv) Enhance performance systems and practices to ensure role clarity, recognition and celebration of success. v) Develop employment policies, practices and consultative mechanisms supporting Organisational goals. vi) Facilitate consistent internal communication, and effective staff engagement through the provision of an integrated set of people practices.
2.2 Optimise delivery of all research activities by improving project management	Provide opportunities for individuals to upgrade their skills in project management.
2.3 Build our global recognition for science leadership in our chosen science domains	Articulate leadership characteristics essential for success in a Global Research Enterprise and align recruitment, performance management and recognition systems.
5.2 Be among the best in governance, OHS&E and performance management processes	Foster a culture that enhances the safety and well being of staff, good governance and project management, and the safety and well being of staff.

5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Implement efficient systems delivering consistent accurate and quality People Development services across CSIRO. Facilitate a One-CSIRO approach to the delivery of Organisational People Development initiatives.
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Improve operational efficiency of PD operating systems and processes.

(b) Governance

PD priorities are established with the ET and EMC. The PD network provides regular reports on progress against the priorities to ET and EMC stakeholders and the CSIRO Board.

(c) Theme Goal

Support CSIRO managers in creating and maintaining a work environment in which employees' full potential is realised and directed to the achievement of CSIRO's objectives. This will be measured against the continued improvement in the Staff Satisfaction Index and other Staff Poll categories.

STRATEGIC MANAGEMENT

(a) Overview

Strategic Management is the most critical of the organisation's enabling processes as it effectively provides for the organisation's leadership through the Office of the Chief Executive. Its key leadership activities are supported by wider organisational processes including: Planning; Policy development; Risk Assessment and Audit; and Performance Management and Reporting.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	SME Group Activity
1.3 Champion Flagships to improve the lives of Australians and advance Australia's key industries	Ensure organisation wide understanding of criticality of Flagship Implementation and keep key external stakeholders informed of risks and achievements.
2.4 Help Australia play a leadership role in major international science facilities such as the SKA	Ensure CSIRO's and the nation's interests in the hosting the SKA are represented to and understood by the highest levels in Government.
3.1 Focus and intensify collaboration with universities, CRCs and other agencies	Develop new, and improve existing partnerships through CRCs and target key university alliances for growth. Participate in the development of the WA S&I initiative
3.4 Partner with other agencies to advance Australia's global development contributions	Participate in the Energy and Water initiatives within the GRA
5.2 Be among the best in governance, OHS&E and performance management processes	Champion the development and implementation of emerging Governance and performance measurements systems to promote increases transparency and accountability.

6.1 Secure greater Federally funded support for CSIRO science investment	Provide effective leadership for CSIRO's interactions with ministers, government and parliament in Triennium Funding discussions
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(c) Governance

The organisation's operational and strategic performance is overseen by the Executive Team (ET) chaired by the CEO. A standing agenda ensures regular review of operational performance (research delivery and financial), strategic developments including progress against plan and risk assessment and audit findings. The ET's activities are supported by a number of sub-committees.

The broader management group of the organisation, the Executive Management Council (Chiefs of Divisions and General Managers) meets six times a year. Each meeting has a specific focus related to the organisation's performance and planning cycle (see Figure 6 in Section 1.3).

(d) Theme Goal

The overarching strategic management focus in 2003-04 is twofold, execution and leadership. Firstly, delivery through effective and efficient implementation against the objectives set in the Strategic Plan, with particular reference to Flagship Programs, in the lead up to the Organisation's submission for triennium funding for 2004-05 to 2006-07. Secondly, CSIRO will continue to play a lead role in response to the Government's current wide-ranging policy reviews relating to the future of our National Innovation System, and CSIRO's role within it.

2.5 Corporate Operations

Chief Finance Officer and Executive Director Corporate Operations: Mike Whelan

INFORMATION MANAGEMENT AND TECHNOLOGY

(a) Overview

Information Management and Technology (IM&T) supports CSIRO's business by providing IT, records and library systems and services. The IM&T community delivers services in areas such as

- security;
- telecommunications (data, voice and video);
- computing infrastructure (servers, desktops, laptops, printers);
- applications, including corporate systems like PSS and CSOFServe;
- help desk support;
- contract management;
- library and records management.

The IM&T community also delivers IT projects to enhance the environment it supports.

The organisation's IM&T activities span CSIRO via the Information Technology Services (ITS) unit in the Corporate Operations Group and the IM&T operations of Divisions. These activities are guided by the [IM&T Strategic Plan 2002-05](#).

The overarching purpose of IM&T activities is to create and support an environment that enables and stimulates innovation in CSIRO's scientific research, business practices, commercial and communications activities by providing systems and skills that enhance interaction and collaboration, and which provide timely access to quality information. Development and support of these systems and skills requires close cooperation between Corporate and Divisional IM&T staff and system owners.

Underpinning this purpose are six key operating principles:

- We will achieve greater leverage from CSIRO IT investments by partnering together within the organisations and with external agencies to deliver more cost effective services.
- We value and treat CSIRO's information as an asset to build knowledge by adopting an 'enter once – use many times' approach to managing information.
- We recognise that effective security is a key confidence factor for CSIRO, and ensuring appropriate levels of security are part of general risk assessment for the organisation.
- We recognise whole-of-life costs in investment decision making and apply best practice project management to IM&T implementation.
- We ensure that new software applications are only developed where 'off-the-shelf' products are not available. When software is written or modified it will be in a standard applications environment and appropriately documented.

- We will value and develop CSIRO's IM&T people resources to support CSIRO's transition to a Research Enterprise with global reach.

(b) Alignment with CSIRO's Strategic Plan

All IM&T activities aim to support CSIRO's strategic directions. The following highlights a subset of major activities and their alignment to CSIRO strategic objectives.

Strategic Plan Objective	Information Management and Technology Activity
2.2 Optimise delivery of all research activities by improving project management	Deliver workflow systems that support the implementation of the Project Management Improvement (PMI) initiative. In addition ensure the integration of these systems with new business intelligence systems and existing PSS and CIS information systems.
5.2 Be among the best in governance, OHS&E and performance management processes	Support the completion of the development of a CSIRO Governance Framework and detailed plan for its implementation. In particular ensure alignment between enterprise and system architectures as well as provide systems support for completing the implementation of the Program Performance Framework.
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Complete the development and implementation of 'CSIRO Live'. Commence implementation of the CSIRO enterprise IT security strategy. Complete implementation of contract simplification system.
5.4 Implement standard processes and IT systems to enhance collaboration and efficiency	Continue to develop the use of standard processes in service level management, capacity and continuity planning, and problem management to ensure excellence in service delivery.
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Identify major IM&T support processes for review and undertake process mapping and strategic cost analysis to identify savings or improved effectiveness opportunities. Adopt a one-CSIRO approach to purchasing communication services.

(c) Governance Processes

The CSIRO Business Needs Working Group (CBNWG) meets quarterly to consider the alignment of planned Information Technology investments with wider business needs. The CBNWG is Chaired by the EDCOG and made up of the GM ITS, DCE, EDBD&C and the Group Chairs of the Environment and Natural Resources Group and the Agri-Food and Health Group.

In the coming year, we will work to establish One CSIRO IT governance processes and structures to enhance the accountability and successful performance of the IM&T community.

(d) Theme Goals

- **Strengthening governance** – through improving project selection; improving project/service management; clarifying roles, responsibilities and relationships between IT and other groups within CSIRO; protecting CSIRO's interests, especially

through helping the Organisation meet its obligations as a government agency, and through business continuity planning;

- **Enhancing One CSIRO efficiency and effectiveness** – through supporting collaboration by email, voice, video, data and other means; increasing knowledge sharing and the e-enablement of science; continuing major projects initiated in Strategic Action Plans I-III; leveraging One CSIRO procurement power;
- **Striving for service excellence** – through effective service delivery and improvement;
- **Enabling change** – through further establishing and developing CSIRO's Enterprise Architecture; through creating a secure environment that supports CSIRO's business and meets Commonwealth standards; by strengthening internal and external relationships; and
- **Investing in our people** – both as individuals (through improving processes like recruitment, induction, etc.) and collectively (through improving OHS&E levels, consultation through the ITS Slice Group, etc)

FINANCE AND FUNDING MANAGEMENT

(a) Overview

The funding management process primarily encompasses:

- the appropriation of funds from the Government in accordance with CSIRO's triennium funding agreement (the organisation's primary funding source) and other specifically targeted funds;
- co-investment funds from research and industry collaborators;
- contract research and consulting funds from industry;
- revenue generated from the exploitation of the organisation's intellectual property (IP); and
- revenue generated from the investment of surplus funds, the sale of surplus assets or other produce

The outcomes of these revenue generating activities are closely linked with the deployment of resources on core strategic research, co-investment research, contract research and consulting services. The relationship between the funding sources and expenditure are managed in accordance with research costing and pricing guidelines. The product of this process is articulated in an overall investment model for the organisation. Further details of the budgeted makeup of the organisation's investment model for 2003-04 can be found in Section 3.1.

It is important to note that the funding management process also encompasses the generation of efficiencies from a one-CSIRO approach to purchasing and the achievement of cost savings across the organisation's support processes more generally. Resources freed by these efficiency mechanisms are added to other revenue sources for deployment into further value adding activity.

With almost \$1 billion in annual expenditure in CSIRO, funding management is a critical support process for the organisation as its aim is to ensure the organisation has sufficient financial resources to achieve its strategic objectives and operational needs. The strategic leadership of the funding management process is provided by the Corporate Finance unit

within the Corporate Operations Group and by the Business Development and Commercial function. These groups work closely with a significant deployment of complementary finance and commercial resources within Divisions.

(b) Alignment with CSIRO's Strategic Plan

Strategic Plan Objective	Funding Management Activities
6.1 Secure greater Federally funded support for CSIRO science investment	Provide financial, analytical and coordination support to the Chief Executive in regard to CSIRO's Triennium bid and associated NPP request for ongoing Flagship Funding
6.3 Deliver customer value for money and eliminate subsidisation in consulting services	Support Group Chairs in the roll out of improved consulting services costing and pricing arrangements.
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Identify major research support processes for review and undertake process mapping and strategic cost analysis to identify savings or improved effectiveness opportunities.

(c) Governance Processes

CSIRO's Expenditure Review Committee meets twice per year to frame the organisation's corporate expenditure budget. This is a sub-committee of the Executive Team chaired by the EDCO and made up of the CEO, DCE, EDCO and the Group Chair Sustainable Minerals and Energy

(d) Theme Goals

The 2003-04 financial-year is a critical one for CSIRO as it seeks to re-negotiate its triennium funding agreement with the Commonwealth and ensure additional appropriation resources to support the ramping up of the Flagship Program.

The year ahead will also see further significant growth in non-appropriation revenues, particularly co-investment funding associated with CRC's and other industry groups. In addition to the growth in co-investment revenue management effort will be deployed on improved project costing to ensure subsidisation is eliminated from consulting and contract research activities.

Complementing these measures aimed at increasing revenue will be a goal with a major focus on research support activities and purchasing costs to undertake an enterprise wide analysis of support processes with a view to identifying and realizing savings and other improvements in efficiency and or effectiveness.

FACILITIES MANAGEMENT

(a) Overview

Facilities Management is the management, maintenance, performance and production of property infrastructure. The CSIRO estate comprises a substantial nationwide property portfolio of diverse property assets and highly specialised buildings.

The Organisation's facilities are managed by the CSIRO Property unit within the Corporate Operations Group, and Divisional support personnel. The Corporate Property unit comprises Strategic Planning, Estate Management, Design and Construction and Maintenance, Energy Services and Security.

The overarching purpose of CSIRO's Facilities Management, documented in the Estate Management Plan 2003-08, is to provide the mechanism for the ongoing and effective management of all of the organisation's real property assets, both owned and leased, with the aim of optimising their operational capacity and maximising their benefits for facilitating scientific research for the foreseeable future.

The basic principles underpinning the achievement of the objectives of the Estate Management Plan are:

- **Property for Research** - CSIRO's property assets are corporate assets and will be managed to achieve maximum benefits and value from efficient Estate usage, consolidation and rationalisation. Property Assets must contribute to CSIRO's overall research objectives and their ownership must demonstrate clear benefit to the Organisation.
- **Tenure of Property (Ownership/Leasing)** - CSIRO should evaluate and review all alternative tenure options for the estate consistent with research needs and duration and economic benefit to ensure that CSIRO's occupancy is appropriately secured.
- **Best Practice** - CSIRO will adopt best practice in its property management to increase effectiveness and efficiency and add value to its property assets; and implement a Performance Measurement Program for estate management and benchmark performance with other kindred organisations.
- **Partnering for Research Infrastructure** - CSIRO will seek maximum scientific and financial advantage from partnering with other research and related institutional and industry infrastructure.
- **Reinvestment in Research Facilities** - CSIRO will implement a long-term strategy to fund and manage a rolling capital expenditure program to ensure that CSIRO facilities continue to fulfill research needs, and optimize the value of the overall Estate.
- **Cost Effective Use of Accommodation** - CSIRO will operate an Internal Leasing Scheme (ILS) to: identify to users the real cost of providing research accommodation; ensure economic use of the assets and provide incentive to users to rationalise their accommodation; and provide an internal mechanism for funding all capital works, leasing and repairs and maintenance programs.
- **Energy and Ecological Sustainable Development (ESD) initiatives** - CSIRO will implement a strategy to identify and provide energy savings for the users of its accommodation and provide realistic ESD initiatives for new and existing facilities to reduce greenhouse gas emissions.

These principles are interdependent and, together, underpin effective and efficient property management practices and initiatives that culminate in the achievement of CSIRO Property objectives.

(b) Alignment With CSIRO's Strategic Plan

Strategic Plan Objective	Facilities Management Activity
3.1 Focus and intensify collaboration with Universities, CRCs and other agencies	Maximising opportunities to share sites and facilities with strategic partners
5.2 Be among the best in governance, OHS&E and performance management processes	Further development of site and building security for the safety of users and CSIRO's intellectual property; and continuing attention to maintaining safe and functional condition.
6.4 Reduce overhead and purchasing costs and manage balance sheet for reinvestment	Identify major facility support processes for review and undertake process mapping and strategic cost analysis to identify savings or improved effectiveness opportunities; continuing rationalization and consolidation of sites and implementation of cost efficient and environmentally effective energy conservation measures.

(c) Governance Processes

CSIRO Property continually reviews and benchmarks its activities and procedures on all levels (within CSIRO, Government and Industry).

- CSIRO Property complies with Organisation and Government policies and standards and has developed appropriate procedures and working practices to ensure such compliance.
- CSIRO Property adheres to probity principles in all commercial and contractual transactions.

(d) Theme Goals

CSIRO Property will contribute to the execution of a number of strategic objectives over the next 12 months. In particular the unit will focus on investing in collaborative arrangements, improving workplace safety and improving efficiency.

OPERATIONAL PERFORMANCE

(a) Overview

The Operational Performance Unit is a small unit within the Corporate Operations Group which is responsible for the development and implementation of a number of critical performance management and planning processes. In particular the unit is responsible for the implementation of the Project Improvement Initiative (PMI), the development and implementation of the organisation Program Performance Framework and coordination of organisational and operating unit operational planning.

(b) Alignment With CSIRO's Strategic Plan

Strategic Plan Objective	Strategic Management Activities
2.2 Optimise delivery of all research activities by improving project management	Implement the PMI and ensure its integration with the Program Performance Framework and associated information systems.

5.2 Be among the best in governance, OHS&E and performance management processes	Complete the development of a CSIRO Governance Framework and develop a detailed plan for its implementation. Provide direction and support for completing the implementation of the Program Performance Framework. Support the integration of functional performance measures into the organisation's performance framework.
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(c) Governance Processes

The initiatives undertaken within the unit are generally supported by Divisional based reference groups to ensure appropriate alignment of strategic intent with operational capability. The unit also ensures coordination of Divisional input into major processes via its organisation and facilitation of two of the six annual EMC workshops – Operational Plans and Budgets (April) and Corporate and Division Performance (August).

(d) Theme Goals

The Operational Performance Unit will provide strategic and operational leadership for the implementation of the project management and performance measurement activities described in this Operational Plan. These activities are collectively designed to improve overall organisational accountability and support quality and more transparent decision making.

Section Three Supporting Information

3.1 Financial information

Statement of Financial Performance
CSIRO Priority Allocations
Statement of Financial Position
Primary Schedule - Cash Flows
CSIRO Financial Resources

3.2 Program Performance Framework

Summary Presentation
Glossary of Terms

3.3 Organisational Risk Profile

Summary CSIRO Risk Profile
Detailed Risk Assessment
Risk Assessment Methodology

3.4 Primary and Enabling Processes Model

3.1 Financial Information

Statement of Financial Performance 2003-04

	\$ '000
Revenues	
Appropriation	568,107
Co-investment & Consulting	290,841
IP, Royalties	22,000
Interest	7,559
Other External	1,100
Total Revenue	<u>889,607</u>
Expenses	
Salaries	544,757
Suppliers	292,470
Depreciation & Amortisation	85,262
Other	2,486
Interest & Financing Cost	3,632
Total Expenses	<u>928,607</u>
Profit(Loss)on Sale of Assets	<u>9,000</u>
Operating Result	<u>-30,000</u>

CSIRO Priority Allocations	Flagships & Other Major Initiatives	Emerging Science Areas	Priority Driven Core Research	Other Activities	Total
	\$ m	\$ m	\$ m	\$ m	\$ m
Direct	52.300	13.700	441.816	24.291	532.107
Divisional Leverage	52.300	13.700			66.000
	104.600	27.400	441.816	24.291	598.107
External Revenue spent	36.610		293.748	0.142	330.500
Total Expenditure	141.210	27.400	735.564	24.433	928.607

Details of Other Activities:	Expenditure
	\$ m
Science Co-ordination and Management	4.915
CSIRO-wide services	44.850
<i>Less: Allocated to Divisions/Others</i>	-44.850
CSIRO-wide obligations/ SAP initiatives	19.518
Total Other Activities	<u>24.433</u>

Statement of Financial Position 2003-04

	\$ '000
Liabilities	
DEBT	
Loans	75,000
Leases	82,653
Deposits	36,495
Overdrafts	0
Other debt	0
Total debt	194,148
PROVISIONS AND PAYABLES	
Employees	169,993
Suppliers	39,132
Other	49,676
Total provisions and payables	258,801
Total liabilities	452,949
EQUITY	
Accumulated results	438,825
Reserves	481,251
Total Equity	920,076
Total liabilities and equity	1,373,025
Assets	
FINANCIAL ASSETS	
Cash	136,566
Receivables	142,059
Investments	2,409
Accrued revenue	0
Total Financial Assets	281,034
NON-FINANCIAL ASSETS	
Land	115,426
Buildings	706,690
Infrastructure, plant and equipment	236,392
Intangibles - Computer Software	3,662
Other Intangibles - Intellectual Property	0
Inventories	896
Other non-financial assets	28,925
Total non-financial assets	1,091,991
Total assets	1,373,025

Primary Schedule - Cash Flows 2003-04

	\$'000
OPERATING ACTIVITIES	
CASH RECEIVED	
Taxes, fees and fines	0
Sales of goods and services	307,122
Interest	7,571
Appropriation receipts (Dept & C'wealth Authorities)	568,107
GST Input Tax Credits	29,662
GST receipts from customers (GST Input Credit rec)	<u>28,778</u>
Total cash received	941,240
CASH USED	
Payments re employees	560,764
Payments re suppliers	294,448
Interest on debt & other financing costs	3,632
GST Payments to ATO	29,247
GST Payment to suppliers	28,991
Other	<u>1,170</u>
Total cash used	918,252
Net cash from operating activities	22,988
INVESTING ACTIVITIES	
CASH RECEIVED	
Proceeds from sales of property, plant & equip & intangibles	27,900
Other	<u>0</u>
Total cash received	27,900
CASH USED	
Purchase of replacement assets	75,794
Purchase or replacement of intangibles	1,332
Other	<u>0</u>
Total cash used	77,126
Net cash from investing activities	-49,226
FINANCING ACTIVITIES	
CASH RECEIVED	
Loans from DoFA	0
Other (trust funds)	<u>0</u>
Total cash received	0
CASH USED	
Repayments of borrowings	3,532
Other	<u>0</u>
Total cash used	3,532
Net cash from financing activities	-3,532
Net Increase/Decrease in Cash Held	-29,770
Add Cash at 1 July	<u>166,336</u>
Cash at 30 June	136,566

CSIRO Operational Plan 2003-04

CSIRO Financial Resources 2003-04

Division	Revenue			Expenditure	Operating Result ¹
	Total	External	Appropriation *		
	\$' m	\$' m	\$' m	\$' m	\$' m
CORE BUSINESS					
Agribusiness & Health:					
Livestock Industries	42.821	12.800	30.021	42.745	0.076
Livestock Industries - AAHL	33.045	10.980	22.065	32.402	0.643
Health Sciences and Nutrition	24.735	6.363	18.372	24.386	0.349
Plant Industry	77.792	34.540	43.252	80.021	-2.229
Forestry and Forest Products	32.791	14.211	18.580	33.145	-0.354
Food Science and Technology	17.842	0.000	17.842	17.542	0.300
Total Agribusiness & Health	229.026	78.894	150.132	230.241	-1.215
Environment & Natural Resources:					
Entomology	35.419	17.616	17.803	35.742	-0.323
Sustainable Ecosystems	41.008	13.491	27.517	41.958	-0.950
Marine Research	42.051	14.442	27.609	42.051	0.000
Atmospheric Research	23.139	6.470	16.669	26.301	-3.162
Land and Water	58.728	23.750	34.978	58.150	0.578
Oceanographic Research Vessel	6.773	0.657	6.116	7.782	-1.009
Total Environment & Natural Resources	207.118	76.426	130.692	211.984	-4.866
Information Technology, Manufacturing and Services:					
National Measurement Laboratories	17.572	3.371	14.201	17.549	0.023
Telecommunications & Industrial Physics	44.963	15.421	29.542	47.061	-2.098
Textile and Fibre Technology	23.163	11.042	12.121	25.407	-2.244
Mathematical and Information Sciences	36.228	11.187	25.041	35.266	0.962
Manufacturing & Infrastructure	78.788	26.000	52.788	78.438	0.350
Molecular Science	33.995	12.699	21.296	34.472	-0.477
Australia Telescope	32.576	11.542	21.034	30.424	2.152
Total IT, Manufacturing and Services	267.285	91.262	176.023	268.617	-1.332
Sustainable Minerals and Energy:					
Energy Technology	22.999	7.460	15.539	22.856	0.143
Petroleum Resources	18.444	8.009	10.435	19.044	-0.600
Minerals	42.634	18.010	24.624	43.334	-0.700
Exploration and Mining	33.275	14.520	18.755	35.402	-2.127
Total Sustainable Minerals and Energy	117.352	47.999	69.353	120.636	-3.284
Outreach Programs:					
CSIRO Publishing	9.361	8.133	1.228	8.607	0.754
Discovery Centre	0.743	0.103	0.640	1.090	-0.347
Education	3.923	2.905	1.018	3.923	0.000
Total Outreach Programs	14.027	11.141	2.886	13.620	0.407
Infrastructure:					
High Performance Computing & Communications Centre	0.000	0.000	0.000	0.945	-0.945
Land & Building	17.424	5.216	12.208	17.008	0.416
Radioactive Material Waste Management Facility	0.400	0.000	0.400	0.400	0.000
Total Infrastructure	17.824	5.216	12.608	18.353	-0.529
Total Core Business	852.632	310.938	541.694	863.451	-10.819
Other:					
Science Co-ordination and Management	4.915	0.000	4.915	4.915	0.000
CSIRO-wide services	44.850	0.000	44.850	44.850	0.000
Less: Allocated to Divisions/Others	-44.850	0.000	-44.850	-44.850	0.000
CSIRO-wide obligations/ SAP initiatives	19.518	0.142	19.376	19.518	0.000
Net Funds pending final allocation (eg. Flagships/ESA etc)	3.732	1.610	2.122	22.913	-19.181
IP Revenue & Contingent expenditure	8.810	8.810	0.000	8.810	0.000
Other Total	36.975	10.562	26.413	56.156	-19.181
Organisational sub-Total	889.607	321.500	568.107	919.607	-30.000
Profit on sale of Assets & Contingent expenditure	9.000	9.000	0.000	9.000	0.000
Organisational Total	898.607	330.500	568.107	928.607	-30.000

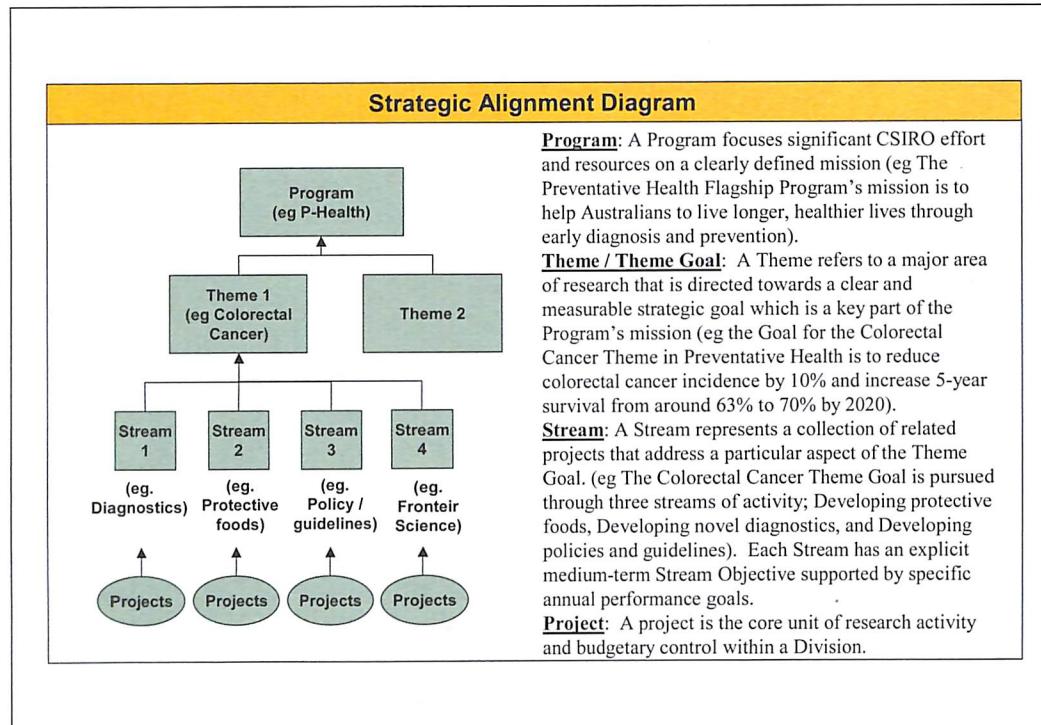
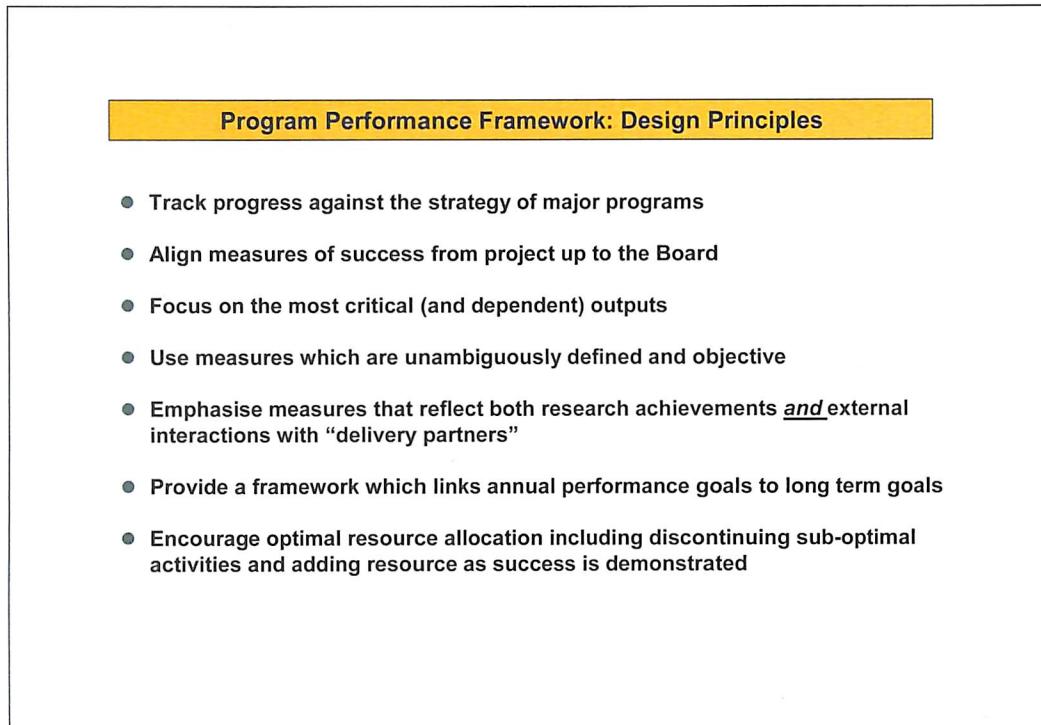
¹ Operating Result before Gain/Loss on sale of assets.

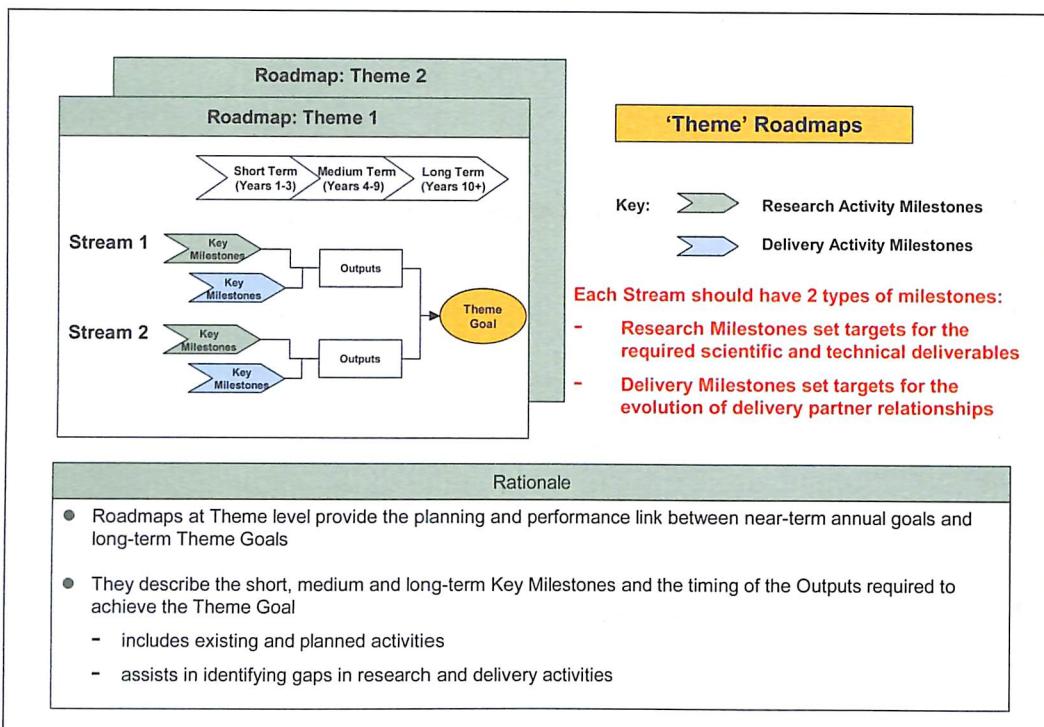
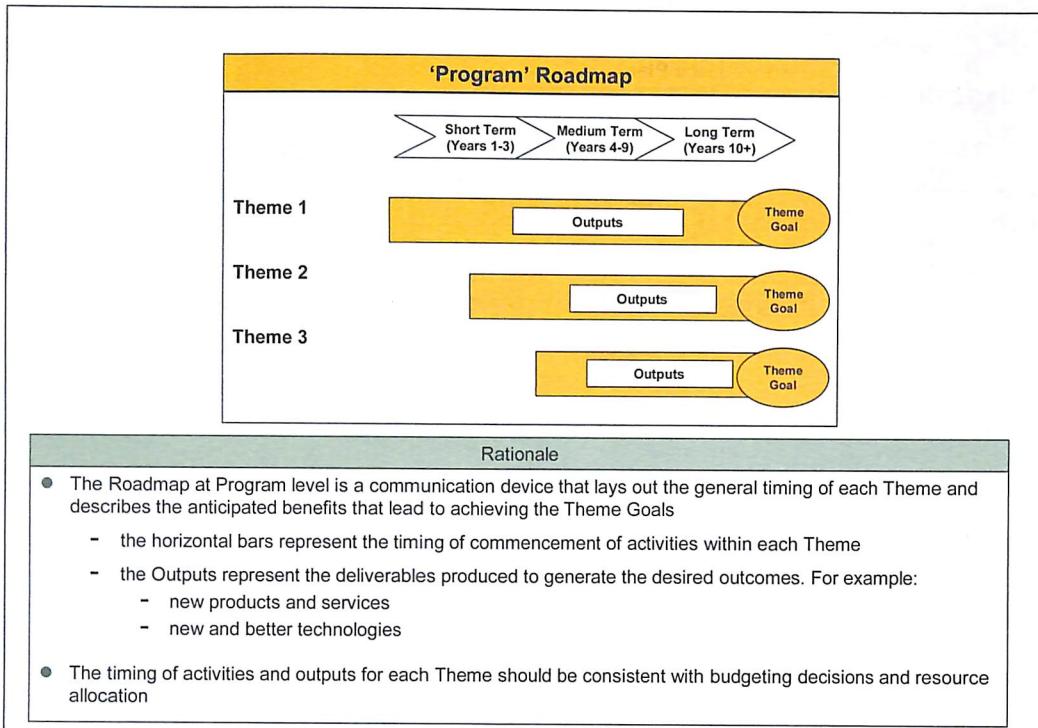
* - includes appropriation towards CSIRO-wide services allocated

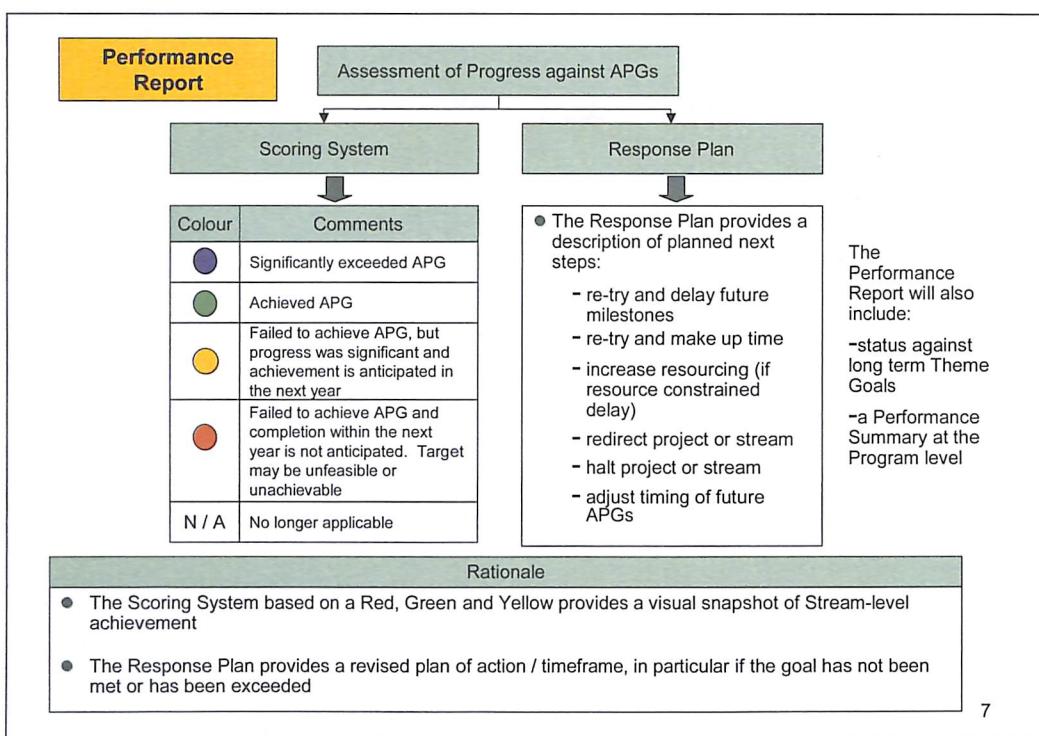
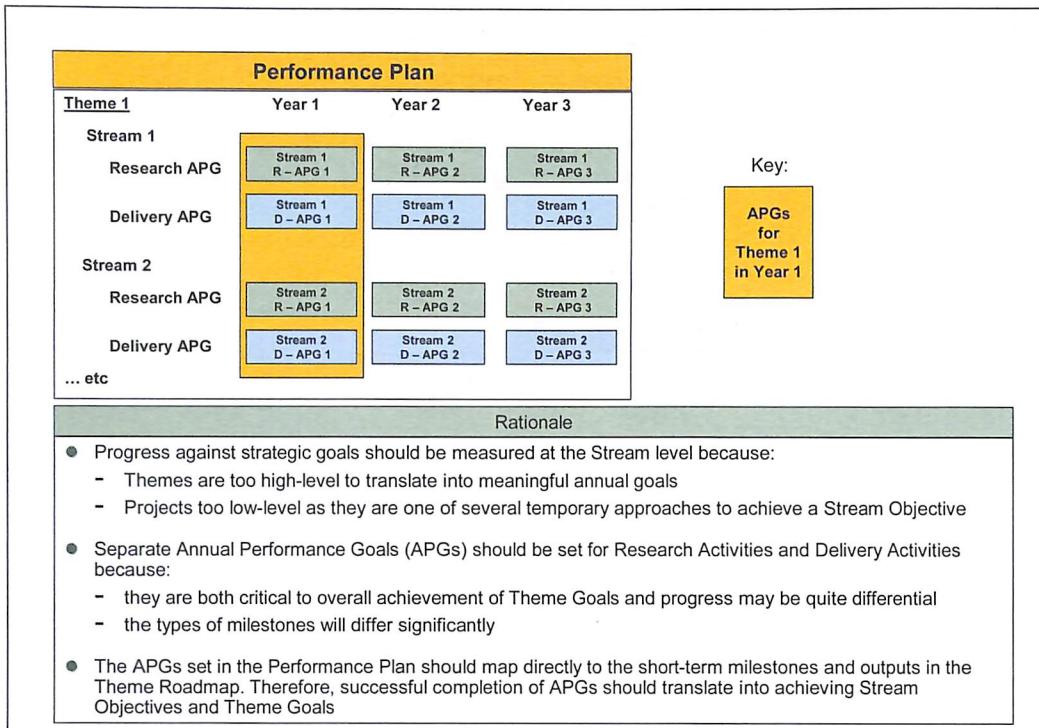
3.2 Program Performance Framework

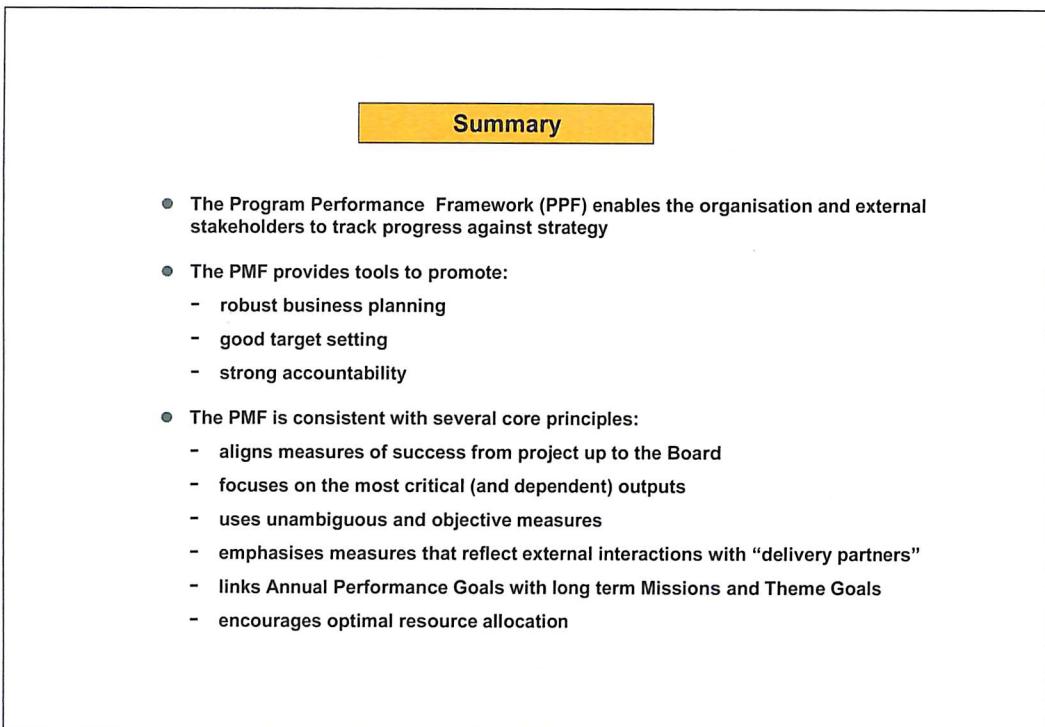
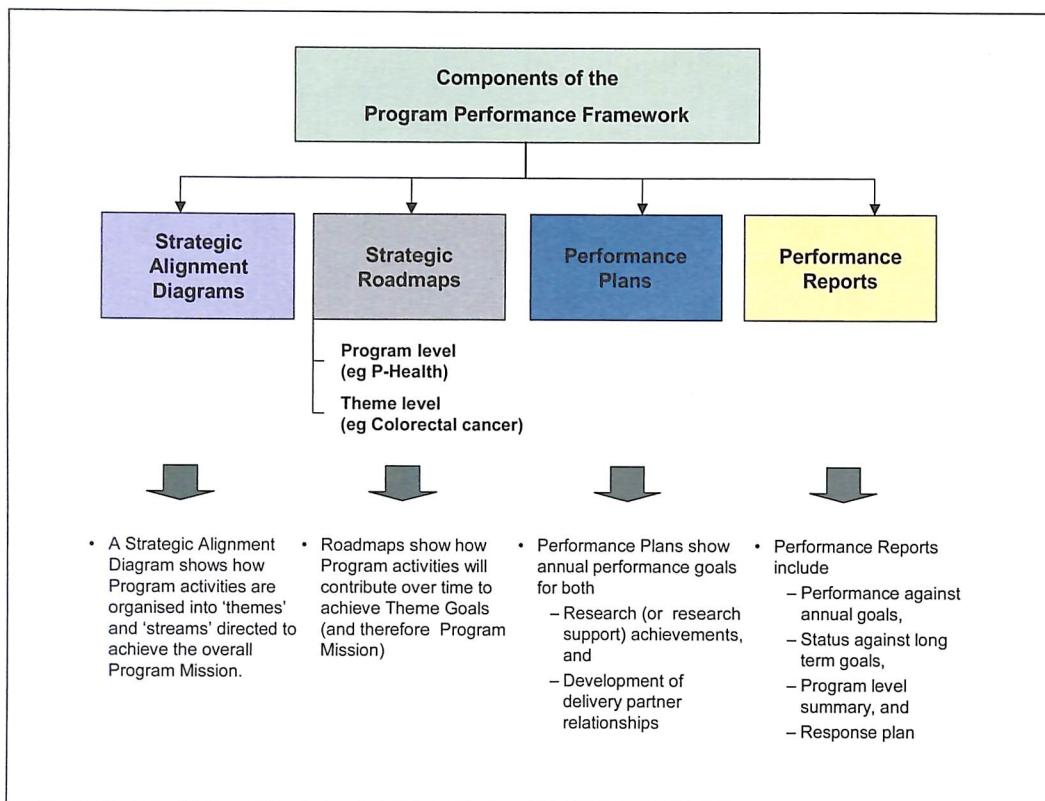
This section includes a set of summary slides followed by a glossary of terms associated with the Program Performance Framework.

(a) Summary Presentation









(b) Glossary of Terms

The following terms associated with the Program Performance Framework are arranged in “logical” rather than alphabetical order.

Program Performance Framework

The Program Performance Framework sets out CSIRO’s activity in a hierarchy of Programs, Themes, Streams and Projects. It incorporates a set of tools developed to promote robust business planning, good target setting and strong accountability in the implementation and performance of major programs. The PPF has been adopted by the Flagship Oversight Committee.

In line with commitments in the CSIRO Strategic Plan, application of the tools will progressively be extended through Emerging Science, Priority Driven Core Research and CSIRO-wide Support initiatives. To this end, guidelines for Divisional Operational Plans 2003-04 have been developed to ensure that they reflect important features of the framework including:

- clarity of alignment from program goals to project activities;
- setting of annual performance goals consistent with long-term strategic goals;
- setting targets for both research achievements and for the evolution of delivery partner relationships.

Strategic Alignment Diagram

A Strategic Alignment Diagram illustrates the contribution of project/stream/theme activities to the Mission of a Division or a Program that is part of a CSIRO-wide initiative (a Flagship, Emerging Science or Major Cross-Divisional Program).

Program

A Program focuses significant CSIRO effort and resources on a clearly defined mission. (*Example*: The Preventative Health Flagship Program’s mission is to help Australians to live longer, healthier lives through early diagnosis and prevention).

Theme

A Theme is a major area of research directed towards a Theme Goal which is a key part of the Program’s or Division’s mission.

The Theme Goal specifies clear and measurable impacts over a given timeframe. This demonstrates CSIRO “ownership” of the strategic problem and its intention of making an impact. (*Example*: The Goal for the Colorectal Cancer Theme in Preventative Health is to reduce colorectal cancer incidence by 10% and increase 5-year survival from around 63% to 70% by 2020).

Stream

A Stream is a collection of related projects that address a particular aspect of the Theme Goal. (*Example*: The Colorectal Cancer Theme Goal is pursued through three streams of activity; Developing protective foods, Developing novel diagnostics, and Developing policies and guidelines).

Stream Objectives are measurable medium-term goals that each Stream needs to achieve in order to contribute to the Theme Goal. Stream objectives quantify expected outputs over a given timeframe.

Annual Performance Goals (APGs)

Annual Goals set at the Stream level. APGs indicate whether a Stream is making the annual progress required to achieve the Stream Objectives and Theme Goal. Thus, APGs should reflect the major short-term events, deliverables or decisions (critical milestones) required to achieve the Stream Objective.

Separate APGs are set for Research Activities and Delivery/Engagement Activities because:

- they are both critical to overall achievement of Theme Goals
- progress may be quite differential and
- the types of milestones will differ significantly.

Research APGs set targets for the required scientific and technical deliverables.

Delivery/Engagement APGs set targets for the evolution of delivery partner relationships necessary to ensure successful technology transfer/adoption.

Project

A Project is a unit of activity and budgetary control within a Division.

Outcome

An Outcome is the impact sought or expected by application of research outputs.

Output

Outputs are the actual deliverables - goods and services - produced to generate the desired outcomes.

CSIRO's Strategic Goals and Objectives

Six strategic goals and 24 underpinning objectives articulated in CSIRO's Strategic Plan for 2003-2007.

3.3 Organisational Risk Profile June 2003

As part of CSIRO's ongoing Risk Management program, the Organisational Risk Profile is reviewed every six months and then presented to the Board Audit Committee. The attached profile has been facilitated by CSIRO RA&A in consultation with Executive Team Members.

The Organisational Risk Profile is outlined on the following pages. The profile highlights both the inherent (initial or worst case) and assessed risk levels for each risk area. The assessed risk level is determined after taking into account management controls (or risk mitigation) that are currently in place.

A Sub Committee of the Executive Team is to form a Risk Management Committee, which will meet regularly to review, amongst other items, the Organisation Risk Profile and monitor progress against agreed risk management strategies and actions.

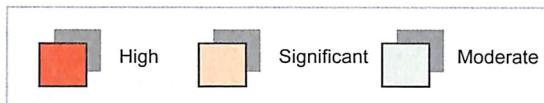
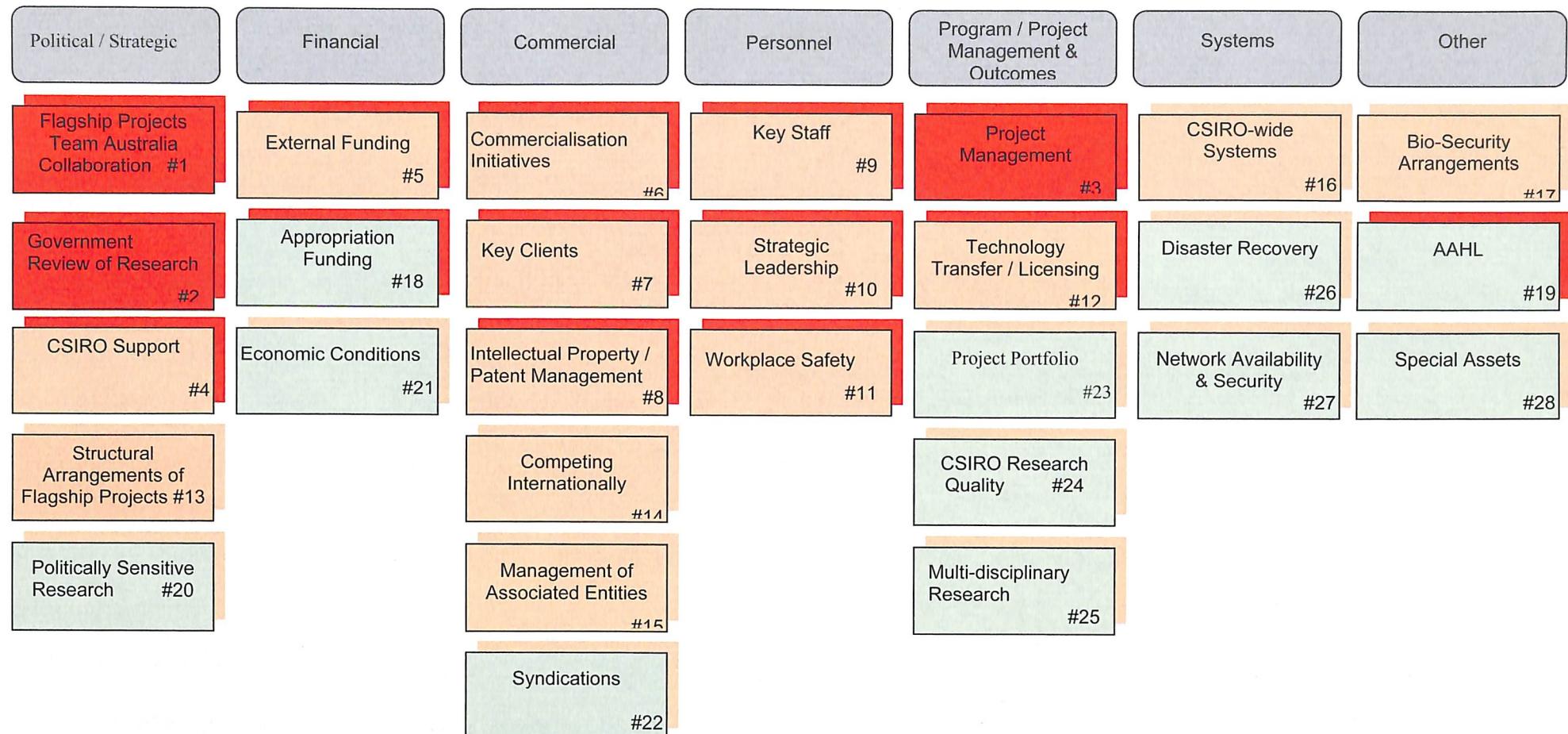
The following are the three assessed high risks to CSIRO noted in the report:

Flagship Projects	The Risk that Flagship Projects do not deliver quality outputs
Government Review of research	The risk that the Government's review of research will lead to adverse outcomes for CSIRO
Project Management	The risk that project management processes and outcomes are sub optimal

These risks are being actively managed, with controls in place and strategies under development to further reduce the likelihood of the risk eventuating, where possible.

The profile details high, significant and medium risks and is followed by an outline of the risk assessment methodology.

SUMMARY CSIRO RISK PROFILE - JUNE 2003



* Shadow denotes inherent risk

DETAILED RISK ASSESSMENT

HIGH RISKS

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Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
<p>Flagship Projects Team Australia Collaboration</p> <p><i>Risk that Flagship projects do not deliver quality outputs</i></p> <p>#1</p>	<ul style="list-style-type: none"> - Loss of revenue - Poor research output - Failure to deliver value for money 	<ul style="list-style-type: none"> - Perceived by external entities as failure to get external buy-in - Unable to implement one-CSIRO approach to Flagships - Poor science / project selection - Failure to implement and deliver against critical success factors for Flagships - Mobility to achieve effective collaboration and deliver according to emerging science priorities. 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Flagship process established for bids - Ongoing financial assessment / Flagship Oversight Committee - Agreements to negotiate the price of resources - Directors appointed to Flagships for regional Australia <p>STRATEGIES</p> <ul style="list-style-type: none"> - Champion Flagships to improve the lives of Australians and advance Australia's key industries - Establish strong ongoing review processes - Alignment with National research priorities <p>EXECUTIVE TEAM LEADER: Ron Sandland</p>
<p>Government Review of Research</p> <p><i>Risk that the Government's review of research will lead to adverse outcomes for CSIRO</i></p>	<ul style="list-style-type: none"> - Major structural change to CSIRO - Loss of funding - Distraction of key goals/priorities 	<p>The Government are proposing to commence a number of critical reviews which have a direct effect on CSIRO objectives and future activities</p>	<p>STRATEGIES</p> <ul style="list-style-type: none"> - Contribute actively to Industry and Government discussions. - Strong engagement with dept undertaking review - Strong research and data analysis to support CSIRO's position - Service the needs of Government for informed policy setting <p>EXECUTIVE TEAM LEADER: Geoff Garrett</p>
<p>Project Management</p> <p><i>Risk that project management processes are sub-optimal</i></p> <p>#3</p>	<ul style="list-style-type: none"> - Poor outcomes - Loss of support - Waste of resources - Loss of CSIRO Research 	<ul style="list-style-type: none"> - Ineffective systems for management of research projects - Adverse ANAO audit report - Perceived deficiencies in project management across CSIRO - Lack of on-going tracking of project achievement and milestone delivery - Ineffective and uneconomic project management policies and procedures or lack of compliance - Proposed ANAO follow-up review to commence July/August 2003 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Project management initiative team and plan established - Project management progressing in line with plan - Project management policy and guidelines promulgated - Project management training and support <p>STRATEGIES</p> <ul style="list-style-type: none"> - Optimise delivery of all research activities by improving project management - Ongoing audit of project management across CSIRO - Integration of PMI and performance outcome with remuneration and rewards processes - Develop mechanisms for effective roll out of PMI <p>EXECUTIVE TEAM LEADER: Mike Whelan</p>

SIGNIFICANT RISKS

	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
<p>CSIRO Support</p> <p>Risk that CSIRO loses Government / industry / public support</p> <p>#4</p>	<ul style="list-style-type: none"> - Loss of focus, outputs not maximised - Loss of funding 	<ul style="list-style-type: none"> - Potential for Government to be unclear as to CSIRO's role (basic / strategic / applied research) and its relationship to other research providers - Failure to meet Government performance expectations - Failure to maintain balance in research activities between private and public good - Public perception that science is not providing adequate benefits or value for money - Negative manipulation / perception of CSIRO's media - Failure to deliver useful outcomes to industry 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Minister's statements have been positive - Extension of CSIRO's as announced in budget May 2003 - Innovation Statements Federal and State <p>STRATEGIES</p> <ul style="list-style-type: none"> - Secure greater Federally funded support for CSIRO science investment - Enhance communication to raise public and stakeholder excitement and trust in science - Strategic planning process currently in progress - Strategic science plan - Grow new science investment area - Fostering better integration with the national innovation network <p>EXECUTIVE TEAM LEADER: Ron Sandland</p>
<p>External Funding</p> <p>Risk that funding from external (non-Government) bodies is reduced</p> <p>#5</p>	<ul style="list-style-type: none"> - Downturn in economy leading to reduction in industry funding - Loss of flexibility & opportunities - Cash constraints - Redundancies 	<ul style="list-style-type: none"> - Potential problem with industries' commitment to R&D and how it interfaces with CSIRO - Private sector funds not sustained to level required - State based funding strategies ineffective - Strong international competition and external market factors - Internal support for CSIRO international contracts limited 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Customer focus is maintained through strong communication processes - Account management, relationship building with industry - Favourable pricing review outcomes <p>STRATEGIES</p> <ul style="list-style-type: none"> - Customer satisfaction initiatives - Development of ten major strategic alliances - Target Australia's top ten companies <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>

SIGNIFICANT RISKS

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Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
Commercialisation Initiatives <i>Risk that commercialisation initiatives are not successful</i> #6	<ul style="list-style-type: none"> - Commercialisation objectives compromised - Failure to research effectively/ then commercialise - Loss of reputation - Breakdown of key management process 	<ul style="list-style-type: none"> - Inability to identify routes to markets - Inability to raise venture capital interest - Key client relationships either low or over promising - Diverse business models for commercialisation - Increasingly complex commercial arrangements - Pace of change to commercial initiatives - Poor coordination between Corporate and Divisional BD&C activities - Potential process failure given pace of commercial initiatives - Building governance - Ability to integrate and influence research objectives. 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Comex and Board Commercial Committee oversight - Use of business analyst expertise - In-house legal team with external advisors - Recruitment of appropriate commercial and legal advisors - Training of existing staff in these areas <p>STRATEGIES</p> <ul style="list-style-type: none"> - Improve processes for negotiation of contracts and pricing - Mergers and acquisition strategy by BD&C to build large strategic relationships globally - Introduction of further venture capital - Formulation of commercial risk reduction tactics. - Development of business plans <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>
Key Clients <i>Risk that key clients are lost</i> #7	<ul style="list-style-type: none"> - Reduced external funding 	<ul style="list-style-type: none"> - Dependence on a narrow range of clients and others for the majority of external income (e.g. Rural R&D Corporations and CRC's) - Ineffective management of client relationships - Client choice of alternative providers - Downturn in economy leading to cutbacks in science spend by clients 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Key Account Managers appointed <p>STRATEGIES</p> <ul style="list-style-type: none"> - Intensify engagement with RDC's to grow regional and new industries - Adopt a unified approach to dramatically improve service and grow top accounts - Structure deeper and more meaningful relationships with large corporations - Focus and intensify collaboration with Universities, CRC's and other agencies - Customer satisfaction initiatives - Development of ten major strategic alliances - Target Australia's top ten companies - Building alliance / targeting strategies into Divisional plans <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>
Intellectual Property / Patent Management <i>Risk that IP and patent management is sub-optimal</i> #8	<ul style="list-style-type: none"> - Reduced capacity to meet future challenges - Loss of Government / public confidence - Loss of revenue opportunities 	<ul style="list-style-type: none"> - Loss of control of IP - Poor knowledge valuation and management - Poor commercial skills and staff management practices - Focus on short term goals - Potential for legislation on dormant IP to be introduced into Australia 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Oversight by Comex and Board Commercial Committee <p>STRATEGIES</p> <ul style="list-style-type: none"> - Proactively manage patent portfolio to multiply IP-based revenue streams - Define and scope CSIRO's patent portfolio - Review of dormant IP by BD&C - IP audit by BD&C <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>

SIGNIFICANT RISKS

Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
<p>Key Staff</p> <p><i>Risk that key staff are not attracted and/or retained</i></p> <p>#9</p>	<ul style="list-style-type: none"> - Inability to carry out key research - Reduced quality of outputs - Loss of reputation - Loss of support 	<ul style="list-style-type: none"> - Strong external market demand - Increasing private sector salaries precludes recruitment of some high quality staff into CSIRO, particularly in the IT&T areas - Global research of CSIRO diminished by inability to recruit senior staff from overseas, due to exchange rates - Inadequate workforce and succession planning - Lack of career path in CSIRO - Increasing workloads on key staff - Staff movement to spin off companies or Universities where they can share commercial successes - Competition for resources 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Staff satisfaction insight poll results - Talent management initiatives - Workforce and succession planning - More innovative recruitment and remuneration strategies - Implemented performance based rewards and recognition framework - Employment flexibility through Clause 11 arrangements - Career management portfolio to improve CSIRO's ability to meet personal development needs of staff - Use of staff exit polls for feedback <p>STRATEGIES</p> <ul style="list-style-type: none"> - Concentrate people processes on developing, attracting, exciting and retaining talent - Review conditions of service for Post Docs - Establish University partnership programs - Talent management initiatives feedback actions <p>EXECUTIVE TEAM LEADER: Ron Sandland</p>
<p>Strategic Leadership</p> <p><i>Risk that strategic leadership is not delivered</i></p> <p>#10</p>	<ul style="list-style-type: none"> - Lost opportunities - Underperformance against key objectives - Poor staff performance and low morale 	<ul style="list-style-type: none"> - Ability to think strategically is reduced because of inability of staff to climb out of routine work - Lack of prioritising workloads - Complexity of PDM roles, with the competing demands diminishing the capacity to tackle strategic issues - Individual work preferences contribute to a lack of attention to strategic issues - The challenge of transitioning from operational to strategic issues - Poorly managed change programmes - Instability, dissatisfaction, high turnover rates and lack of clear lines of responsibility 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Strong Board & Board processes - Communication of CSIRO's vision, purpose and beliefs to staff / stakeholders - Strategic Action Plan - Achieving recruitment strategy defined organisation structure and new appointments <p>STRATEGIES</p> <ul style="list-style-type: none"> - Enhance strategies for selection of current and future leaders - Introduce career development / mentoring processes - Revamp strategic planning processes Corporate & Divisions <p>EXECUTIVE TEAM LEADER: Geoff Garrett/ Ron Sandland</p>

SIGNIFICANT RISKS

Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
Workplace Safety <i>Risk that a safe workplace is not maintained</i> #11	<ul style="list-style-type: none"> - Injury / death in workplace - Director's liability - Loss of reputation - Litigation - Regulatory sanction - Increased costs through claims and increased insurance premiums 	<ul style="list-style-type: none"> - Complying with legal requirements - Recent death at AAHL - Adequacy of workplace inspections - Hazardous substances and processes - Hazardous sites, buildings and equipment 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Endorsement of OHSE policy and safe practices - OH&S Committee and Regional Health Safety Environment - Advisors structure recently reviewed - OH&S audits and incident reporting in place - Renewed emphasis on workplace safety with recent conference in Melbourne <p>STRATEGIES</p> <ul style="list-style-type: none"> - Embed the new OHS&E strategy - Implement recommendations from AAHL enquiry - Implement outcomes from continuous audits <p>EXECUTIVE TEAM LEADER: Ron Sandland</p>
Technology Transfer / Licensing <i>Risk that technology transfer and licensing is not managed effectively</i> #12	<ul style="list-style-type: none"> - Loss of reputation and / or litigation - Underachievement of key objectives - Loss of support 	<ul style="list-style-type: none"> - Government perception that CSIRO is slow to commercialise research outcomes - Lack of market expertise - Lack of technical expertise - Immature technology - Lack of commercial acumen in CSIRO - Lack of business models for determining appropriate ROI - Lack of monitoring and business decisions regarding licensing - Structural arrangements i.e. Licensing vs company - CSIRO investor friendly - Scientists underestimate value - Lack of adequate funding to commercial at optimal time 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Market research undertaken - Secondment of CSIRO staff to commercialisation agency - Patents and licensing <p>STRATEGIES</p> <ul style="list-style-type: none"> - Partner or perish/ technology up-taking strategies - Continue to improve commercial practices and benefits from licences <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>
Structural Arrangements of Flagship Projects <i>The risk that Flagship projects are not adequately supported</i> #13	<ul style="list-style-type: none"> - Flagship projects do not meet objectives 	<ul style="list-style-type: none"> - Inability to provide adequate support arrangements to facilitate cross divisional flagship projects - Inability to adequately resource projects, requires major resource shift from Divisions 	<p>CONTROLS (Mitigating Factors)</p> <p>STRATEGIES</p> <ul style="list-style-type: none"> - Further develop resource and operational plans <p>EXECUTIVE TEAM LEADER: Mike Whelan</p>

SIGNIFICANT RISKS

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Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
<p>Competing Internationally</p> <p><i>Risk that CSIRO cannot compete internationally</i></p> <p>#14</p>	<ul style="list-style-type: none"> - Loss of competitive advantage and 'seat at table' 	<ul style="list-style-type: none"> - Failure of Government to maintain CSIRO resource levels relative to overseas countries - Failure to attract sufficient external investment - Capacity to deliver competitive advantage - If CSIRO does not deliver it becomes hard to make case to the Government for funding 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Collaborative research relationships - Participation in science and international conventions <p>STRATEGIES</p> <ul style="list-style-type: none"> - Maximise Australia's chances of hosting major international science facilities such as the SKA - Be globally recognised for science leadership in a growing number of science domains - Partner with other agencies to advance Australia's global development contributions - Strategic planning process currently in progress - Strategic science plan focus on emerging science - Talent management initiatives <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>
<p>Management of Associated Entities</p> <p><i>Risk that management of associated entities arrangements are inadequate</i></p> <p>#15</p>	<ul style="list-style-type: none"> - Loss of reputation - Directors' liability - Inadequate return on investment - Restraints on ability to develop surrounding technology 	<ul style="list-style-type: none"> - Governance and bad publicity linked to CSIRO - CSIRO may not be able to control exploitation of IP - Inappropriate non compete agreements - Inconsistent treatment of staff reward / transfer arrangements - Inappropriate transfer of IP to spin-off / spin-out / JV / CRC vehicles - Lack of co-ordination of spin-off / joint venture activities across the Organisation 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Implementation of project risk assessments across CSIRO - Board Commercial Committee established - Increased resources in BD&C - Shareholder policy developed <p>STRATEGIES</p> <ul style="list-style-type: none"> - Review of risks by CommEx & BCC <p>EXECUTIVE TEAM LEADER: Mehrdad Baghai</p>
<p>CSIRO-wide Systems</p> <p><i>Risk that CSIRO wide Systems do not deliver value for money or optimal system arrangements</i></p> <p>#16</p>	<ul style="list-style-type: none"> - Underachievement of key objectives - Lost opportunities 	<ul style="list-style-type: none"> - Inability to articulate business systems requirements - Inability of current systems to support value added systems - Delivery of the project in line with future business requirements - Potential to chose poor /costly options - Inability to add to business value - Non-optimal system arrangement - Not utilising key resources in critical areas. 	<p>CONTROLS (Mitigating Factors)</p> <ul style="list-style-type: none"> - Use of business analyst expert - enhance governance processes - Project office in place - Implement new senior leadership appointments – General Manager appointed <p>STRATEGIES</p> <ul style="list-style-type: none"> - Implement standard processes and IT systems to enhance collaboration and efficiency - Establish investment framework - Establish a process to determine optimal solutions - Gate and approve system investments. <p>EXECUTIVE TEAM LEADER: Mike Whelan</p>

SIGNIFICANT RISKS

Risk Issue	Potential Effect(s)	Potential Risk Factors	Controls and Future Risk Strategies
<p>Bio-Security Arrangements</p> <p><i>The risk of further Bio-security incidents</i></p> <p>#17</p>	<ul style="list-style-type: none"> - Negative reputation and image - Loss of Government support 	<ul style="list-style-type: none"> - Concerns over further breakdown in policy and procedures around containment - Two recent breaches of containment 	<p>CONTROLS (Mitigating Factors)</p> <p>STRATEGIES</p> <ul style="list-style-type: none"> - Review Bio-security procedures <p>EXECUTIVE TEAM LEADER: Mike Whelan / Group Chairs</p>

MEDIUM RISKS

Risk Issue	Risk Description
Appropriation Funding #18	<i>Risk that appropriation funding reduces in nominal or real terms</i>
AAHL #19	<i>Risk of escape of GMO / bio-control / disease agents from AAHL</i>
Politically Sensitive Research #20	<i>Risk that politically sensitive research impacts adversely on CSIRO</i>
Economic Conditions #21	<i>Risk that an economic downturn will impact adversely on CSIRO</i>
Syndications #22	<i>Risk that syndications create adverse impacts upon CSIRO</i>
Project Portfolio #23	<i>Risk that project portfolio does not meet stakeholder requirements</i>
CSIRO Research Quality #24	<i>Risk that quality of CSIRO is perceived as inadequate</i>

MEDIUM RISKS

Risk Issue	Risk Description
Multi-disciplinary Research #25	<i>Risk that CSIRO does not deliver on multi-disciplinary research</i>
Disaster Recovery #26	<i>Risk that disaster recovery capabilities are inadequate</i>
Network Availability & Security #27	<i>Risk that network availability and security is compromised</i>
Special Assets #28	<i>Risk of damage / loss to special assets'</i>

RISK ASSESSMENT METHODOLOGY

The risk assessment methodology, adapted from the Australian Risk Management Standard AS/NZS 4360:1999, involves identifying the risk and analysing each risk in terms of how likely it is to happen (Likelihood) and the possible impacts (Consequence). The final risk score for each risk is calculated by combining Consequence score with the Likelihood score. This will give a risk score of between 2 and 10, which can then be referred to the Risk Scoring Matrix (refer below) to give a risk rating of HIGH, SIGNIFICANT, MEDIUM or LOW. Where there is more than one risk measurement area for scoring consequence, the highest combination of scores is taken as the final risk score. The initial risk score before consideration of existing risk treatment strategies and mitigating controls is called the *inherent risk* grading. The *assessed risk* grading takes into account management's perception of the effectiveness of current controls. These controls provide the mitigating effects that have the potential to or actually do reduce, the level of risk.

Scoring Example:

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Consequence risk score of
Likelihood risk score of

4 (major)
2 (unlikely)

Grading: Significant risk

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RISK SCORING MATRIX

LIKELIHOOD		CONSEQUENCE				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain	5	S	S	H	H	H
Likely	4	M	S	S	H	H
Possible	3	L	M	S	H	H
Unlikely	2	L	L	M	S	H
Rare	1	L	L	M	S	S

3.4 Primary and Enabling Processes Model

To succeed in carrying out the functions ascribed to it, and so fulfil its purpose, CSIRO must perform to a high standard across a range of core value-generating and enabling processes. Understanding these processes and mapping them to roles and responsibilities, as well as to systems, policies and procedures is fundamental to implementing good corporate governance.

Over the course of 2003-04 CSIRO will look to further develop an emerging model of value generating processes, illustrated in Figure 14.

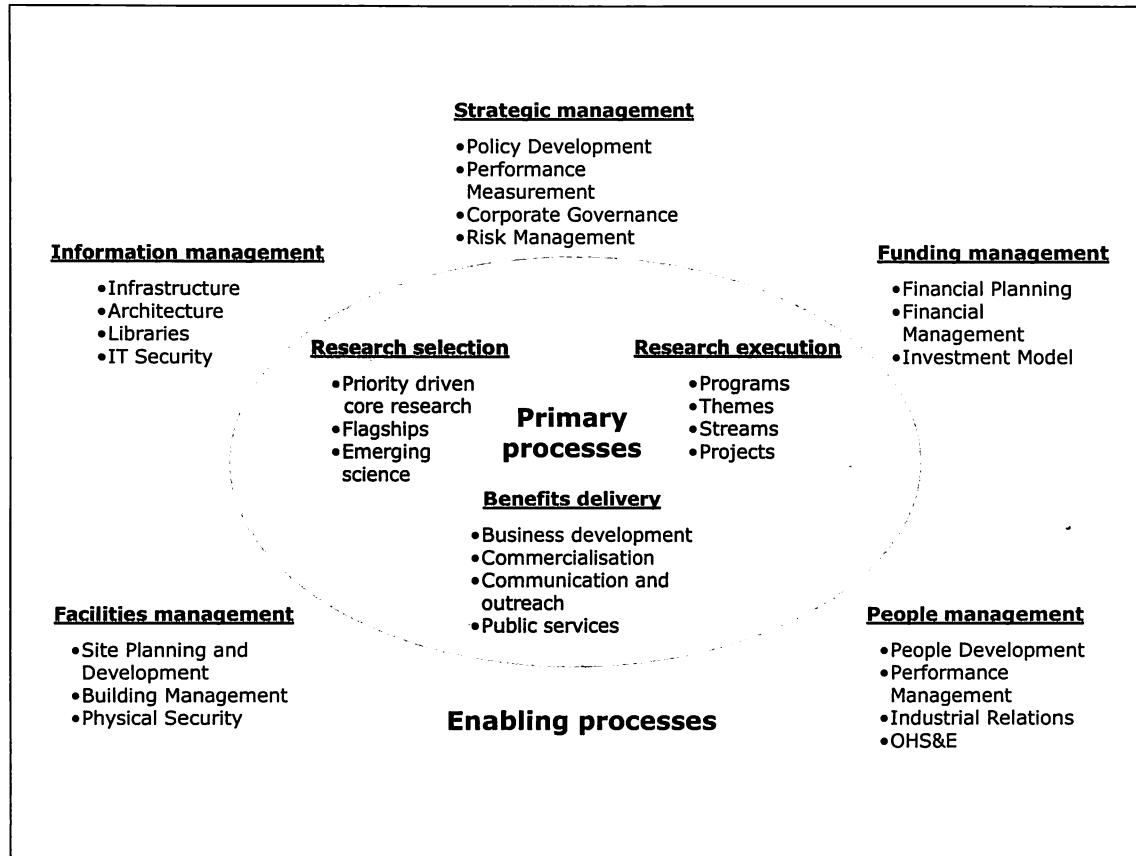


Figure 14: Primary and Enabling Processes

The primary processes mapped out in the model attempt to describe how CSIRO generates and distributes value via a number of closely interacting pathways. These Primary value generating processes are supported by a variety of Enabling Processes.

A working group consisting of the Chief Finance Officer, Corporate Secretary, and the Managers of Risk Assessment and Audit, and Corporate Legal have responsibility for facilitating the further development of the Operating Platform model and the organisation's corporate governance framework more generally.

