



**Commercialisation and
Utilisation Plan
April 2007**

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1 Introduction

This document has been prepared for Department of Education Science and Training to present the Bushfire CRC's plan to deliver, through commercialisation and technology transfer and adoption, the maximum national benefits to Australia.

Cooperative Research Centres, generally known as CRCs, bring together researchers from universities, CSIRO and other government laboratories, and private industry or public sector agencies, in long-term collaborative arrangements which support research and development and education activities that achieve real outcomes of national economic and social significance. The Bushfire Cooperative Research Centre (CRC) began in July 2003.

To become operational, every CRC must execute two major legal Agreements; these are described on the CRC website (www.crc.gov.au) as follows:

Commonwealth Agreement

Participants in successful CRC applications are required to enter into a formal agreement with the Commonwealth ('the Commonwealth Agreement'). Under this agreement, the Commonwealth agrees to provide a certain level of funding each year to the Centre, and the Centre participants agree to undertake certain activities, contribute specified personnel and certain levels of resources. The term of the agreement is up to 7 years.

The Commonwealth Agreement has set clauses that provide the legal basis for the operation of the program. Detailed commitments on a Centre's budget, activities, staffing and performance indicators are contained in schedules to the agreement. These commitments are based on the proposal accepted by the CRC Committee, subject to any conditions of offer.

Centre Agreement

Participants in a Centre are also required to enter into a formal agreement amongst themselves ('the Centre Agreement'), which covers matters such as management, equity, ownership and licensing of Intellectual Property, and employment of staff. The Centre Agreement must be consistent with the CRC Program objectives and guidelines.

Intellectual Property ("IP") is defined by the Federal Department of Education, Science and Training ("DEST") as covering:

"all copyright (including rights in relation to phonograms and broadcasts), all rights in relation to inventions, plant varieties, trade marks (including service marks), designs and circuit layouts, and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields, but does not include Moral Rights, the rights of performers or rights in relation to Confidential Information".

In addition this plan refers to Intellectual Capital (IC) which has many definitions in the Knowledge management arena relating to the treatment of intangible assets in an organisation, however in this document it is taken to be defined as "Knowledge that resides within an individual or group of individuals and is not in the public domain"¹

Consistent with the objectives of the CRC Programme and the Commonwealth Agreement, this plan outlines the market potential, principles and treatment of IP, measuring the benefit and strategies to realise the value of CRC Intellectual Property.

¹ The National Innovation Council, The Innovation Website, DITR, Australian Government
<http://www.innovation.gov.au/index.cfm?event=object.showContent&objectID=3EF7FF42-65BF-4956-BE67F9FE06F2A032#I>

2 Bushfire CRC Mission

To enhance the management of bushfire risk to the community in an economically and ecologically sustainable manner.

3 Objectives and Outcomes

This plan outlines the area of operation of the Bushfire CRC, the types of outcomes that can be expected and the way in which these outcomes will be taken to market. These will focus on the national and regional benefits that will be derived from these outcomes.

This document should be read in conjunction with the following documents:

- The Bushfire CRC Commonwealth Agreement (and its variations)
- The Bushfire CRC Centre Agreement
- The Bushfire CRC Ltd Constitution

In any interpretation, the above documents take precedence over this plan, and nothing in this plan should be taken as a variation of the above documents.

The basis of the plan is clause 9.4 of the Commonwealth Agreement as follows: ‘the maximum national benefits accruing to Australia will be deemed to have been delivered where the Intellectual Property in Contract Material is commercialised or otherwise made available in a way that results in industry expansion or activity within Australia. Where there are no opportunities for commercialisation within Australia and the commercialisation of the Intellectual Property occurs in a country other than Australia, the Intellectual Property must be commercialised in such a way that substantial national benefits will accrue to Australia’.

This plan has been written to comply with the “National Principles of Intellectual Property Management for Publicly Funded Research”²

It should also be noted that the implementation of this plan and any dealings in the Intellectual Property must have the approval of the Governing Board unless specifically delegated to the management of the CRC.

4 Market Potential and Monitoring

The primary market for any Intellectual Property (IP) developed will be our partner organizations. These can broadly be split into the following groupings:

4.1 Partners

- 🚒 Fire Authorities (both rural and metropolitan).
- 🌳 Land Management Agencies.
- 🔬 Research providers (such as Universities; CSIRO; Bureau of Meteorology).
- 🏛️ Other Government end user agencies (such as EMA, ABCB, Bureau of Meteorology).

² http://www.arc.gov.au/grant_programs/national_ip.htm

The research program of the CRC is strongly driven by these groups, in particular, the end-user groups. This has ensured that the research is focussed on particular areas of need in the groups.

General Characteristics of Market Segments

An analysis of the potential markets was undertaken by the CRC and it was decided that the most appropriate market segmentation model for the intellectual property created by the CRC is as listed below. These market segments represent the key pathways for commercialisation of Intellectual Property created during the life of the CRC.

4.2 State and Federal Government Agencies

The primary stakeholders in the CRC are the State and Federal Government agencies. These agencies are responsible for the provision of emergency service or land-management functions in their various jurisdictions. These agencies will constitute the primary route through which the Intellectual Property of the CRC will be commercialised. This Intellectual Property will lead to reduced costs, more efficient and effective decision-making and more efficient and effective policy-making.

Utilising the Stakeholder Council, the Governing Board, End User Leader structures and contacts within these agencies, Intellectual Property will be transferred through various mechanisms, including the appointment of technology transfer officers within the CRC and the use of agency staff. Another primary route of technology transfer will be the inclusion of the agency staff in the research program, allowing and technology transfer to occur as Intellectual Capital.

The CRC will track the adoption of research outputs and the transfer into research outcomes by the end-user agencies by reviewing the progress on a regular basis through regular reports to the Board.

It is also likely that the intellectual capital and intellectual property of the centre will be drawn upon by our state agencies to carry out inquiries and investigations of fire events, for example, the recent fire on the Eyre Peninsula. Except where the work proposed aligns with specific Bushfire CRC research plans, such requests will be treated in a similar way to contract research and access to the IP and IC will be negotiated on a case-by-case basis.

4.3 Industry

Although there is no formal representation of private industry within the CRC's partnership, industry plays a key part in the translation of research outputs into outcomes for the agencies. The CRC will work with the suppliers of our partner agencies to ensure that maximal value is delivered to them, whilst ensuring protection of the national benefit (for example, Australian suppliers would be preferred to overseas suppliers).

The CRC will endeavour to engage with the industry as required to ensure that the maximal benefit is derived to Australia and particularly to the partners of the CRC. An example of this is the recent licensing arrangements and joint research undertaken with BlueScope Steel.

The industry players have a number of roles which can be split into number of categories as listed below:

- ✚ Category one: *Industry, which support the delivery of emergency services (for example, Vector Command)*

- ✚ Category two: *Industry, which provides services to the community (for example, architectural firms)*

- ✚ Category three: *Industry, which provides advice and products to the community (for example, steel manufacturing companies, or glazing companies)*

4.4 International

The use of Intellectual Property by international organisations and companies will be examined on a case-by-case basis. It is important to recognise that many of the issues being investigated by the CRC are issues which are important in other countries and regions around the world. The CRC is building links with leading international research organisations to be able to leverage off the Intellectual Property and Capital being generated within the CRC with research being undertaken in these international groups. The CRC's Intellectual Property and Capital will be used as a means to access the Intellectual Property of these other organisations, leading to a greater understanding and overall benefit to Australia. This will be managed through formal instruments such as Memorandums of Understanding, Heads of Agreement, or research agreements.

Where there are opportunities to commercialise Intellectual Property belonging to the CRC into international markets, this will be explored fully. The Governing Board will endeavour to identify leading Australian multi-national organisations, which may be able to commercialise the Intellectual Property internationally. Where this is not possible, the Board will then explore existing relationships with international organisations to ensure the rapid commercialisation of the Intellectual Property. Any agreements will endeavour to protect the national benefit to Australia.

4.5 Community Groups

The CRC's role in informing the community is enshrined within its public outreach program. The CRC clearly has a role in informing the community on the science underpinning bushfire mitigation and management issues. It is also worth noting, however, that the CRC is not the primary source of advice to communities on their expected behaviour or comment on public policy as this is the role of our partner agencies. If the CRC were to provide such advice it could expose the CRC to possible legal liability, and potentially place us in conflict with our partners.

The CRC is currently developing a series of public seminars in fire-prone areas to raise the awareness of the research and role of the Bushfire CRC. In these forums, selected disclosure will be used to ensure the protection of the centre's Intellectual Property.

It is also worth noting that the CRC will produce an intellectual underpinning for policy, practice and new product concepts. In order to take advantage and utilise these research outputs, adoption and transformation is required to build the policy and practice within the various end-user organisations. This is analogous to the traditional product development life cycle, see figure 1.

The major difference in the two processes shown in figure 1, is that the dollar return from products usually shows up as revenue where as the dollars in the second process show up as cost savings through productivity gains, lives saved, more efficient capital utilisation, reduced property damage or other intangible outcomes.

The value of cost savings is the subject of economic research being undertaken in the Bushfire CRC's Programme C. Early estimates are that cost savings could be as high as 20 times the investment in research.

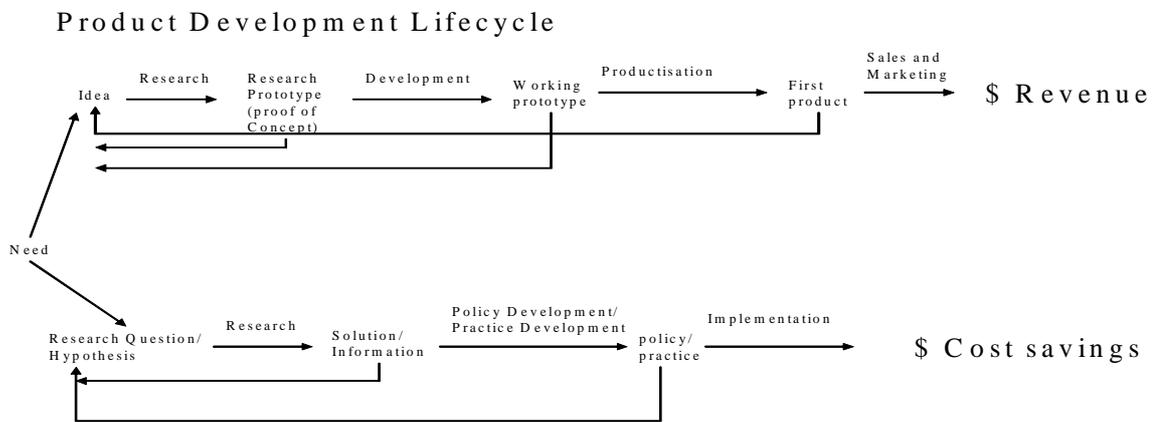


Figure 1: Product development lifecycle compared with policy or practice development

4.6 Types of Intellectual Property generated

The CRC will generate three predominant types of Intellectual Property. These can be split into commercial, environmental and social.

4.6.1 Commercial

The CRC from time-to-time will generate Intellectual Property, which may have commercial value outside of its partners. The commercialisation of this IP will in the first instance be offered to our partner agencies for commercialisation. This will take the form of a licensing and commercialisation agreement to ensure the maximum benefit is derived for the CRC and Australia. If the partner agencies do not wish to commercialise this Intellectual Property, the CRC Board will consider commercialisation through external parties. Options may include the licensing or assigning the Intellectual Property to a major corporation or SMEs; engagement of seed-stage Venture Capital companies, or direct licensing to individual researchers or interested parties. Priority will be given to Australian Companies who can grow the Australian economy.

4.6.2 Environmental

Environmental Intellectual Property will be utilised through our partners or through publication in peer reviewed journals. It is unlikely that these will lead to commercial outcomes for the CRC.

4.6.3 Social

As the primary role of the CRC is for public benefit, the majority of Intellectual Property created by the CRC will fall into this category. Utilisation of this Intellectual Property will be through our partners; through public forums, through publications and through the CRC website and the media. The key element of

utilisation through our partners will be ensuring that the CRC and its partners can communicate the outcomes to the public in an effective and uniform way. The CRC's role in communicating with the public will primarily focus upon communication of science outcomes; whereas the agencies roles will focus more on the policy and practical outcomes.

The markets for the outcomes of the research from the Bushfire CRC are largely Australasian and international publicly-funded emergency service organisations or land management agencies that have substantial budgets and responsibilities for the protection of substantial assets, such as property, life, and environmental assets.

All the major Australasian players in these areas are part of the CRC and so the most sensible route for most of the outcomes will be into these agencies directly.

Whilst both the intellectual property in environmental and social categories may not generate direct revenues, its value lies in intangible outcomes. The CRC is currently working on a methodology to be able to effectively evaluate the economic impact of its research outputs.

4.7 SWOT Analysis

Strengths

One of the key strengths of the CRC in terms of the commercialisation of its outputs is that all parties required in the value chain, are parties to the CRC. This has the result that the most effective and efficient route to market for the work of the CRC is through its partners, rather than through external licensing arrangements with third parties.

The major end-users of the CRC are the major players in the delivery of services, especially relating to the work of the CRC. These end-users will play a major role in the commercialisation and utilisation of Intellectual Property and finding commercialisation partners.

A key strength of the CRC is the shared vision of the research agenda and that it has end-users wanting to see the outcomes of the CRC utilised. Indeed the research agenda and program are approved by the end-users and endorsed on an annual basis as being the highest priority areas for research.

A further strength relates to the political goodwill that exists in both State and Federal governments to see this CRC achieve its goals. This is added to by the findings of many inquiries, both Federal and State.

Weaknesses

Whilst having end-users which are well-connected in the Federal and State government arenas is seen as the strength of the CRC, these organisations do not have a strong commercial focus and are not used to dealing in a commercial way with Intellectual Property. This is being addressed through discussions within the CRC by its stakeholders and Board. These organisations also do not have a strong track record of building businesses or construction of structures to maximise the potential to be derived from IP.

It is also clear that many of the researchers working in fields related to the CRC are also not used to dealing in Intellectual Property in a commercial way. Their focus traditionally has been on publications and public-good outcomes.

The players in the CRC do not have good contacts into the venture capital areas or into commercialisation companies.

Most of the end-users also do not have exposure to typical mechanisms for Intellectual Property commercialisation nor do they fully understand the many mechanisms with which commercialisation outcomes can be achieved.

Opportunities

It is clear that the Intellectual Property and Capital of the CRC has substantial value to many commercial organisations. This needs to be managed carefully and the brand of the CRC protected. However, this also creates opportunities to leverage the Intellectual Property through the use of the brand of the CRC.

As has been evidenced by the recent licensing deal with BlueScope Steel, opportunities exist to commercialise the work of the CRC and to add value to the Australian economy. Such licensing deals will be considered as they arise.

Threats

It is likely that the CRC may not generate any commercial Intellectual Property (although this risk is small, as there has already been a licensing arrangement negotiated with BlueScope Steel for joint development of IP). This would adversely impact on the requirement to generate external revenue into the CRC. However, the Intellectual Property that the CRC will generate will have value to the parties of the CRC.

There is a threat to the commercialisation of Intellectual Property in that many international research agencies are also carrying out research in similar areas to the CRC. It is possible that these research agencies may solve some of the problems of the CRC is currently working on in a shorter timeframe. It is worth noting however that many of the issues being investigated in these international research organisations are very region specific and may not apply in Australia.

There is also a threat that within Australia, universities and research bodies not currently part of the CRC may also generate Intellectual Property, which is competitive with that of the CRC. It is well understood that some of our partner agencies continue to fund research outside of the CRC. It is possible that some of these research projects may compete with Intellectual Property of the CRC.

4.8 Market Needs Analysis

The CRC undertakes regular reviews of the research agenda and program. This is usually undertaken by the User's Research sub-committee of the Governing Board to ensure the relevance of the CRC work program to the end-user community. The most recent of these occurred during the third years review and again in the budget setting process in January 2007. These reviews reaffirmed the current research agenda and highlighted gaps in the current research program.

As the End Users represent the most significant market for the Intellectual Property of the CRC, this type of review process helps the CRC establish the usefulness in the marketplace. The end-users act as a proxy for the more general market as they are the major players in Australia, and the issues facing internal agencies are not that dissimilar to those in Australia.

The CRC continues active monitoring of media, particularly print, web and radio for topics which may impact on the direction of the research of the CRC. The CRC is actively identifying complementary work within external bodies, particularly within Australia and overseas universities. This has formed the basis of "The Fire Knowledge Network" described in the recent variation to the Commonwealth Agreement. The CRC also monitors international trends through trade publications, international journals, international conferences and personal contacts. The CRC has also been involved in many of the public inquiries into major fire events. The most significant of these in recent times has been the COAG inquiry into bushfire mitigation. The current response to the inquiry included many recommendations which impact upon the CRC's work program. Similarly the recently tabled Federal Government response to the House of Representatives inquiry in the 2003 fires, "A Nation Charred" contained suggestions for future directions for the CRC. The CRC is currently evaluating these recommendations.

The CRC has developed The Fire Knowledge Network with an aim that this network will collect and synthesise data and information relating to fire research locally and internationally for the use of Australasian communities and agencies. Utilising this network will enable the CRC to be better informed of the current issues in the markets as well as their needs.

The CRC is conscious of the need to be flexible, depending on market needs. The CRC retains contingency funds in the Head Office, to enable rapid movement to meet short-term market changes. The CRC's budgeting cycle is an annual one, enabling rapid change if required. Because of the role of the CRC, it is placed in an excellent position to be able to access extra funding from its State agencies and the Federal Government when required. This process is currently underway for the response to the COAG inquiry mentioned above.

4.9 Likely Intellectual Property Created In Each Program

It is worth noting that the CRC is currently engaged in a research project to determine the likely return on investment for the CRC's work program as a whole. This economic analysis is based on the likely return to the community and Australia by investing in the Bushfire CRC and will be open to public comment in the near future. The methodology being applied is similar to that applied by the CSIRO evaluation of many of its research projects. In particular, the recent evaluations into the "Project Vesta" study undertaken in WA in conjunction with state-based agencies³. This project is yet to produce a definitive outcome and the assumptions are yet to be tested. Initial indications are that utilising very conservative assumptions, the likely return on investment for the CRC will probably exceed factor of 20.

Program A

Intellectual Property likely to be created in this program falls into two major categories. Firstly, Intellectual Property that will aid fire prediction and fire management within agencies. This Intellectual Property will be built into models, which will become the tools for the agencies to predict fire behaviour, issue warnings and manage bushfires. These tools typically are built into forecasting systems run as a public good for all of the agencies. This Intellectual Property's valuation is based upon effective and efficient utilisation of firefighting resources, prevention of loss of life of fire fighters and community, reduced losses of assets (physical, environmental and cultural) through better warning systems and preparation. The derivation of this value will be through the agencies, and within the communities served by those agencies. This Intellectual Property will be published in international peer-reviewed journals to ensure the validity of the findings and

³ <http://www.csiro.com.au/index.asp?type=activity&id=Vesta>

verify the methodologies used. It is not likely that this Intellectual Property will generate cash revenues for the CRC. However, the savings to the multiple national agencies, both in time, resources and loss of property and lives will result in the return to the community many times the investment by the CRC.

The second type of Intellectual Property likely to be created in Program A is computer tools either for visualisation of risk or for simulation of fire spread. The CRC has in place mechanisms to ensure full ownership of the outcomes of the research and will continue to monitor the likely commercial opportunities presented through these types of computer tools. The commercial evaluation of such tools is a difficult task as similar tools in the marketplace are either given away free, or sold for substantial sums. The types of models been generated by the CRC are more likely to compete with those being offered free which have been developed by US government departments. The CRC will continue to monitor the possible commercialisation opportunities in this type of Intellectual Property.

Program B

Intellectual Property generated in this program will primarily be burning guides or prescriptions for prescribed burning, as well as data on protection of ecosystems and biodiversity. It is likely, however, that books may be generated as part of this program. The value of this Intellectual Property is largely intangible and any attempt to put a valuation on the ecological assets of Australia's landscape is likely to lead to an unrealistically high outcome. Commercialisation of this Intellectual Property will be through land-management agencies and through community briefings, training courses and workshops

Program C

Intellectual Property generated by program C is primarily social, and is not likely to result in commercial opportunities for the CRC. The value of this Intellectual Property lies in increasing the resilience of communities, reducing the impact of bushfires, reducing the loss of buildings reducing the loss of life through better provision of community education programs by the agencies.

Program D

Intellectual Property generated in Program D has already resulted in one license deal with BlueScope Steel. The current value of this licence deal is of the order of \$100,000 plus a percentage of future sales. It is highly likely that there will be a number of small deals like this one arising from program D. The BlueScope arrangement is a good framework for future opportunities. Active management of the Intellectual Property and engagement of commercial partners will be sought for some of the work within this program. It is interesting to note that the licensing arrangements and external R&D contract covers work that would have otherwise required funding from the core funds of the CRC. In this case, BlueScope Steel has covered much of the cost of the new project, which the CRC would have had to fund utilising the CRC funds, and in this case has retained ownership of Intellectual Property.

Much of the remainder of the Intellectual Property in this program is similar to that in the other programs in that the commercialisation path will be through the agencies or developed into new Australian standards for public good.

5 Principles for Treatment of IP:

Bushfire CRC principles for treatment of IP are consistent with the National Principles of IP Management for Publicly Funded Research.

Centre IP

All IP created by personnel attached to the CRC is Centre IP (i.e. it is owned by the CRC).

Commercialisation Profits

Commercialisation Profits, if any, will be retained by the CRC for further research and are not distributed to shareholders or other parties.

IP Assignment by Students

Where a Student involved in Activities prepares a thesis for examination as part of that Student's assessment regime, copyright in that thesis will be owned by the Student, but rights in relation to Centre IP comprised in that thesis will continue to be owned by the Company.

Background IP

Background IP (BIP) is handled in accordance with the Signed Centre Agreement (see Appendix), with both the BIP Provider and the CRC agreeing and documenting the scope and value in their own registers before the BIP is used.

Contract Research

Where a Participant or a third party agrees to fund contract research, the commercial details, including IP ownership, will be finalised on a case-by-case basis. A licence to use any Background IP on which the New IP is founded will be agreed in advance. If no written agreement is entered in relation to the newly developed IP, the default position is that it is treated as Centre IP under the Centre Agreement.

This is also intended to cover such additional work requested for example in the analysis of fire events for various inquiries and investigations.

Inventor Incentives

There will be no sharing of commercialisation profits (if any) with any person or entity from the activities of this CRC.

External Research Performance Indicators Revenue for Participants

Revenue external to the CRC earned by a Participant for achieving Research Performance Indicators (RPIs) set by other parties because of the Participant's involvement with the CRC will remain with the Participant.

CRC Wind-Up

In advance of the CRC winding up its operations, a Wind-Up strategy will be produced and a wind-up plan will be submitted to the Commonwealth which will specify how Centre IP and commercialisation assets will be handled. The IP register will be finalised to develop a strategy for commercialisation or technology transfer of research results and

the future development of research to ensure the latent potential of incomplete. Intellectual Property can be realised.

6 Treatment of IP

The Commonwealth and Centre Agreements prescribe the treatment of IP by the CRC and its Participants (see Appendix).

The over-arching principle proposed in this Plan is that all IP created by personnel attached to the CRC and in their role within the CRC is Centre IP (i.e. it is owned by the CRC).

Categories of such CRC personnel include:

- direct employees of the (incorporated) CRC
- in-kind staff assigned to the CRC by a Participant, and
- staff seconded to the CRC by a Participant or other party to work under the direction of CRC management or other CRC personnel

6.1 IP specific to the partners of the CRC

This IP will be made freely available to all members of the CRC in line with the conditions of the Centre Agreement. The CRC and its researchers will work with the partners to ensure that the form of the outcome best meets the requirements of the partner to ensure efficient adoption.

6.2 IP of a Public Good Nature

This IP will be published in leading international peer reviewed journals and other publications. The aim for this type of outcome is to ensure that it is as widely disseminated as is possible to inform the debate around the issues related to Bushfires.

7 Strategy to Realise the Value of the IP and IC

The strategies that will be used to realise the value of the IP and Intellectual Capital (IC) will vary depending upon the type of outcome. For example, where the outcome is technology transfer into one of our partner agencies an efficient mechanism for transfer of the intellectual capital will be through engaging staff from that agency in the research program. Whereas, where the outcome is a commercial agreement with a non-partner organisation, a strategy of precise documentation, packaging of Intellectual Property and legal contracts will be employed. The aim at all times is to ensure the rapid and effective adoption of the research outputs. To realise this aim we will have a substantial collaboration between the end users at all stages of the development.

7.1 Problem formulation stage:

The end user groups have been, and will continue to be, involved in setting the direction for the researchers, in formulating the research hypotheses and in defining the research needs. The end-users are the group that approved the research plans through the Governing Board and its subcommittees.

7.2 Project Selection Phase:

Research project selection requires that a number of strategic and management hurdles be met including a selection process which is overseen by the Research Director and subsequently submitted to the End-User Research Sub-Committee of the Board for final endorsement and then approved by the Governing Board.

The CRC strategy for IP commercialisation and utilisation is inherent in the way it selects and funds its projects. For all projects the technology transfer and commercialisation strategy must be detailed and built into the project proposal shown in appendix 2.

Each research project proposal undergoes a rigorous review to ensure there is alignment with the published national research priorities and excellence of research and alignment with the CRC's mission and strategic plan.

7.3 Research Phase:

End-users are strongly encouraged to become engaged directly in the research through active involvement with the research teams. Indeed in many cases the researchers are members of the end-user groups.

During the research phase, the staff and students involved in research within the CRC will undergo commercialisation and Intellectual Property training. This training will include elements such as, what is Intellectual Property, what are the Intellectual Property protection and commercialisation options, disclosure and publication and also the patenting process. This training will be mandatory for all students, and highly recommended to all researchers. This type of training will be complemented by other professional development opportunities being developed by the CRC.

8 Measuring and Communicating the National Benefits

As part of the ongoing work of the CRC, the benefit to the national interest will be examined, indeed the CRC has specific research projects looking at just this topic. The measurement of national benefit will be derived from an economic study being undertaken as part of program C. This study will examine the nature and value of the Intellectual Property being generated by the CRC. Current estimates of the return on investment in the CRC, using conservative assumptions, are greater than 20 times. This model still needs substantial validation and the CRC will continue this project to ensure it is in a position to maximise the national benefit derived from its endeavours. We will also rely, to degree, on our partners to be able to articulate the financial benefits of the CRC's outcomes. We have already initiated these discussions with the key partners to be able to determine base-line positions.

Also, as part of the risk-based approach to the strategic framework for the CRC, the impact will be closely measured through working with our partners to understand the cost savings and efficiencies achieved through utilising the outputs of the CRC. The end user agencies are under increasing pressure to measure efficiency gains and the CRC will use these studies as they take place in the agencies to better understand the value derived from the CRC's work.

Bushfire CRC has established The Fire Knowledge Network (FKN) as a means to promote, disseminate and share bushfire science knowledge more actively, including science, research, factual data, history and human experience, for the benefit of CRC stakeholders, all fire researchers, academics, fire agency staff and volunteers, residents in

fire prone areas, industry, governments at all levels, local communities and an international audience.

While the intent is to develop The Fire Knowledge Network as a part of the Bushfire CRC, the CRC Board acknowledges that the CRC has a finite life and wishes to ensure that into the future, the FKN has the ability to stand as an independent entity.

Through the communications strategies of the CRC we will effectively communicate the derived benefits of the work, for public scrutiny.

Bushfire CRC's IP Policy details the implementation of the principles in the Centre Agreement for IP management and commercialisation.

9 Steps to Commercialisation

The Research Director together with the assistance of the Program and Project Leaders will prepare project agreements and proposals which are reviewed by the Users' Research Sub-Committee of the Governing Board and then put to the Governing Board for approval. These proposals identify (among other things) the priorities/objectives to which the project substantially contributes.

Expected outcomes are identified early and monitored and amended where necessary in quarterly reports, which are provided on a project-by-project basis to the Research Director who measures the progress against the outcomes of the research plan and provides a detailed report to the Governing Board. The recommendation to the Governing Board for approval of the proposed commercialisation activity will include information as to how the activity meets the "Maximum National Benefit test". The information will detail the measures demonstrating that National Benefits would accrue to Australia from the successful undertaking of the commercialisation activity, and how the particular recommendation of a pathway to adoption maximises these benefits. For example, if it is possible to manufacture a product within Australia for national and international distribution, that approach will be recommended above licensing to an overseas manufacturer. That is, the Governing Board will be provided with an assessment of alternative commercialisation options covering each alternative, the potential economic and other national benefit, the probability of success, the time to market or application involved and the risk of loss to competing ventures.

IMAP⁴ (a computerised project management system) commenced operation from July 2005 and will identify and keep track of the anticipated outcomes which are identified in the project agreements. This system will be a powerful tool to assist management in the monitoring of projects and programs against outcomes, milestones and budgets.

Where the CRC develops outcomes that may have a commercial value beyond that of the partners, a number of options will be explored on a case by case basis.

The main steps are:

- Ensuring the effective capture of the IP. The CRC has implemented the use of numbered laboratory notebooks issued to all researchers and monitored by program leaders. Training on how to use the numbered notebooks and the importance of complying with these instructions will be the part of the Intellectual Property training courses run by the CRC for its students and research staff.
- Confidentiality agreements.
- Clarifying ownership rights for background IP.

⁴ www.imap.com.au

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- Evaluation of the protection required (ie. Patents, Copyright, or trade secret).
 - Identification of potential customers.
 - Determination of market value.
 - Determination of engagement model for customers (license, trade sale, admission as partner of CRC).
 - Complete deal.

In all cases Governing Board Approval is required prior to any commercial arrangement being entered into.

10 Technology Transfer Strategy

All end users are exposed to the outcomes of the CRC, and the CRC management have ensured that there are effective mechanisms in place in each of the user groups to make the transfer of the outcomes effective.

It is expected that there will be a number of classes of Intellectual Property outcomes that the CRC may produce and these are covered below. The majority of the IP will fall into the category of being specific to the partners of the CRC, with a smaller amount being in the category of public good, and finally, a small component of commercial IP.

The Bushfire CRC has changed the focus in the education and technology adoption management role to produce a much stronger focus on adoption of the CRC outputs in the agencies. This is aiming to use multiple methods to ensure the uptake of the work. Examples to date have included training courses, workshops, whole of CRC Research into Practice forums (at Beechworth and Wollongong), Fire Notes and Updates and extensive update of the CRC Website.

The broad strategies are:

- Open and effective channels of communication between end users and researchers facilitated by a Communications Manager.
- The implementation of an internet based project management system (IMAP) to be operational from July 2005.
- A strong education and training program targeting current and future fire researchers, bushfire and land managers and the community.
- The implementation of The Fire Knowledge Network to be operational commencing early 2006.
- Implementation of feedback mechanisms located within the overall research strategy allowing continual improvement of:
 - Tools (e.g. firefighting equipment, building design).
 - Modelling of bushfire behaviour and danger (e.g. smoke plume modelling, fire weather predictions).
 - Fire suppression strategies.
 - Management models (e.g. planning and management of prescribed burning, bushfire risk management)
- Establish avenues for legislative change relating to minimisation of fire danger (e.g. building code regulations, policy design).

11 Review of Research Portfolio

A review of the research portfolio to identify market opportunities and associated commercialisation and technology transfer strategies is to be performed annually by the Users Research Committee of the Board.

12 Review of Plan

This plan will be reviewed annually for accuracy and relevance. If amendments are necessary, the revised plan will be submitted to the Commonwealth within 30 days for approval.

APPENDIX 1

1.1 Excerpts from the Centre Agreement

Part A: Introduction

1 Definitions

1.1 In this Agreement, unless a contrary intention appears from the context:

Activities	has the same meaning as 'Activities of the Centre' in the Commonwealth Agreement, and includes the research, training and Commercialisation activities more specifically set out in this Agreement;
Asset	means an item of real or personal property but does not include Intellectual Property;
Background Confidential Information	means Confidential Information which is made available for the Activities by a Party, either at the Commencement Date or during the Term of the Centre, and which has been adequately identified by that Party before being so made available;
Background IP	means that Intellectual Property which is made available for the Activities by a Party, either at the Commencement Date or during the Term of the Centre, and which has been adequately identified by that Party before being so made available;
Centre Confidential Information	means Confidential Information generated as a result of the Activities;
Centre IP	means Intellectual Property developed as a result of the Activities;
Commercialise	in relation to Intellectual Property, means to manufacture, sell, hire or otherwise exploit a product or process, or to provide a service, incorporating that Intellectual Property, or to license any third party to do any of those things;
Commercialisation Account	means the account referred to in clause 24;
Commercialisation Plan	has the same meaning as in the Commonwealth Agreement;
Commonwealth Agreement	means the agreement referred to in Recital;
Confidential Information	means all trade secrets and know-how, financial information and other commercially valuable information of whatever description and in whatever form (whether written or oral, visible or invisible) but excludes the interpretation, analysis and application of general information in the public domain;
Intellectual Property or IP	includes all copyright (including rights in relation to phonograms and broadcasts), all rights in relation to inventions, plant varieties, trade marks (including service marks), designs and circuit layouts, and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields, but does not include Moral Rights, the rights of

	performers or rights in relation to Confidential Information; ⁵
Moral Rights	includes the following rights of an author of copyright material: (a) the right of attribution of authorship; (b) the right of integrity of authorship; and (c) the right not to have authorship falsely attributed;
Party	means a party to this Agreement, and includes the officers, employees, agents and sub-contractors of the Party who are involved in the activities;
Program	means a research, training or Commercialisation program to be carried out under clause ... as part of the Activities;
Program Leader	means a person appointed by the Governing Board under clause ...to act as leader of a Program;
Project	means a discrete, time-bounded research, training or Commercialisation activity to be carried out under clause ... by some or all of Parties within the ambit of a Program;
Project Leader	means the person appointed by the Governing Board under clause ... to act as a leader of a Project;
Seconded Personnel	means the personnel of a Party seconded by it to the Centre as part of that Party's Contribution under clause ..., and includes the Specified Personnel within the meaning of the Commonwealth Agreement;

Part F: Outcome & Results

22 Background IP

- 22.1 From time to time during the Term of the Centre, a Party may make Background IP available for the Activities.
- 22.2 Each of the Parties represents and warrants to each other that:
- a. it is the owner of, or is otherwise entitled to provide, the Background IP which it makes available for the Activities; and
 - b. except to the extent disclosed to the remaining Parties at the time of making available such Background IP, that Background IP is not subject to an Encumbrance.
- 22.3 A Party which makes available Background IP is free to continue to use and deal with it outside the Centre as long as it can still be used for the Activities, including

⁵ This is a general-use definition of Intellectual Property. The Parties may prefer to customise it for their own purposes, but it is not essential to do so, even if some categories mentioned are not thought likely to be relevant to the Activities of the Centre, eg. 'plant varieties', 'circuit layouts'. The words: 'all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields' in the definition are taken verbatim from Article 2 of the *Convention Establishing the World Intellectual Property Organization* of July 1967, and so constitute an important link to the scope of the term 'Intellectual Property' for purpose of international treaties in the field.

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- Commercialisation, but if that Party intends to transfer, encumber or otherwise deal with its Background IP, it must first grant a licence to the Company on terms agreed by that Party and the Governing Board;
- 22.4 Background IP shall remain the property of the Party which made the Background IP available for the Activities.
- 22.5 Each Program Leader shall maintain a register recording such Background IP as is made available by a Party for Projects contained in the Program. The member or members of the Governing Board representing that Party is responsible for approving the register and any amendments to it.
- 22.6 Subject to this Agreement, each Party shall have a non-exclusive royalty-free right to use any other Party's Background IP for the purposes of the Activities other than Commercialisation, as approved by the Governing Board.
- 22.7 For the removal of doubt, a Party is free to use its Background IP:
- a. to conduct research, training or operations outside the scope of the Activities;
 - b. for any statutory functions of that Party; and
 - c. for Commercialisation that is not in competition with any proposed Commercialisation by the Company and is outside the scope of the Activities.
- 22.8 Where a Party who intends to conduct research, training or operations outside the Activities wishes to use Background IP owned by another Party, the Party so wishing shall only be permitted to do so if it obtains a non-exclusive licence on terms agreed by the Party owning that Background IP.
- 22.9 The Parties agree that they will take all necessary steps to protect Background IP and give each other prompt notice of any infringement of Background IP which comes to their attention. Each Party agrees to give a Party which owns such Background IP all assistance which it reasonably requires in order to protect that Party's Background IP. The Party requiring the assistance shall meet any reasonable costs and expenses incurred by the Party providing the assistance.

23 Centre IP

- 23.1 Subject to this clause 0 and clause 22, all Centre IP shall be owned by the Company.
- 23.2 Subject to any decision of the CEO under clause 28, the Company will grant a non-exclusive , royalty free licence for any Student to the extent that such a licence is necessary for that Student to publish any publication that is a requirement of that Student's course assessment.
- 23.3 The Company will consider all reasonable requests to grant licences to authors in respect of proposed publications containing Centre IP.
- 23.4 Each Party shall co-operate with each other Party and promptly do all acts and things and execute all documents which may be necessary for the purpose of confirming ownership of the Centre IP in the Company as contemplated by clause 23.1.
- 23.5 Each Party shall forthwith respond to a request from the CEO or any other Party to provide information in its possession regarding Centre IP which has been developed or is in prospect.
- 23.6 The Parties shall use their best efforts to ensure that their respective employees (including Seconded Personnel), agents, sub-contractors, postgraduate Students under their supervision or other persons participating in the Activities:
- a. shall identify Centre IP generated or developed by them;
 - b. shall promptly communicate details of it to the relevant Project Leader; and

- c. shall promptly do all acts and things and execute all documents necessary for the purpose of vesting ownership of the Centre IP in the Company as contemplated by clause 23.1.
- 23.7 Subject to this Agreement, each Party shall have a non-exclusive royalty-free right to use Centre IP for the purposes of the Activities other than Commercialisation.
- 23.8 Each Party shall have a non-exclusive, royalty free right to use Centre IP in connection with its own internal research, training or operations outside the Activities upon terms agreed with the Company.
- 23.9 Subject to clause 0 and clause 23.8, where a Party outside the Activities develops further Intellectual Property based on or incorporating Centre IP or another Party's Background IP, that further Intellectual Property shall remain the property of the developing Party. However, the developing Party shall not Commercialise its further Intellectual Property without first obtaining a licence, covering such Commercialisation, on terms agreed between the owners of that Background IP and/or Centre IP.
- 23.10 If a Project Leader considers that a particular development arising from that Project may be patentable or the subject of other forms of Intellectual Property protection, the Project Leader shall promptly communicate details of that development to the Governing Board.
- 23.11 The CEO shall decide in consultation with the Parties whether the development warrants pursuing patent protection, or other forms of Intellectual Property protection, and if it does, in which countries protection should be sought.
- 23.12 Unless otherwise agreed by the Governing Board, the CEO is to apply for, maintain and prosecute any form of Intellectual Property protection decided on under clause 23.11.
- 23.13 If patenting or other registrable forms of Intellectual Property protection of Centre IP is pursued, it is to be in the name of the Company.
- 23.14 The Parties shall give the Company prompt notice of any infringement of Centre IP which comes to their attention and each Party agrees to give the Company all assistance which it may reasonably require in order to protect the Company's interest in Centre IP. The Company will indemnify the Party providing the assistance for all reasonable costs and expenses of providing the assistance.
- 23.15 The Centre Account may be drawn upon to meet all costs associated with applying for, maintaining and prosecuting patent or any other form of Intellectual Property protection associated with Centre IP and the application, maintenance and prosecution of any actions which may be associated with any such Intellectual Property and such drawings shall be taken to be expenses incurred in the performance of the Activities.
- 23.16 Where a Student involved in Activities prepares a thesis for examination as part of that Student's assessment regime, copyright in that thesis will be owned by the Student, but rights in relation to Centre IP comprised in that thesis will continue to be owned by the Company.
- 23.17 Notwithstanding clause 23.16, permission for publication under clause 27 must be received before publication of a thesis referred to in clause 23.16.

24 Commercialisation of Centre IP

- 24.1 The Company shall be responsible for the Commercialisation of Centre IP, in accordance with the Commonwealth Agreement, and in particular:
 - a. development and updating of the Commercialisation Plan as required under clause 9 of the Commonwealth Agreement;

- b. Commercialisation of Centre IP in accordance with the Commercialisation Plan;
 - c. presenting Commercialisation options to the Governing Board, consistent with the Commercialisation Plan; and
 - d. any other task relating to Commercialisation of Centre IP that the Governing Board may lawfully delegate to the Commercialisation Manager.
- 24.2 Decisions regarding Commercialisation of Centre IP may only be made by the Governing Board and must be made in the interests of furthering the objectives of the Centre.
- 24.3 Where Commercialisation of Centre IP requires access to a Party's Background IP, that Party shall licence its Background IP to the Company on terms agreed between the Party and the Company. Such terms shall be based upon a determination to be made in accordance with clause 24.4 and shall be no less favourable than the Party would offer to any third party in an arm's length, commercial dealing.
- 24.4 Unless otherwise agreed, determination of the proportion of Background IP contained in Intellectual Property arising from the performance of a Project shall be made by the Parties to a Project prior to Commercialisation. Should a conflict arise, it shall be resolved by unanimous decision of the Governing Board. Failing agreement, such proportion shall be determined in accordance with clause 24.
- 24.5 A Party's Background IP is to be clearly identified as being made available for the purposes of the Centre's research program.
- 24.6 The Company is responsible for :
- a. establishing a 'Commercialisation Account';
 - b. collecting and paying all royalties, licence fees and other receipts derived from Commercialisation of Centre Intellectual Property into the Commercialisation Account; and
 - c. paying all expenses associated with the Commercialisation of Centre Intellectual Property from the Commercialisation Account.

APPENDIX 2

**BUSHFIRE COOPERATIVE RESEARCH CENTRE
PROJECT APPROVAL REQUEST**

Version:

Date:

Operating Budget Year:

PART A: PROJECT IDENTIFICATION

Program:	Title: Research Leader: User Leader:						
Project:	Number: <i>(Provided by CRC Business or Research Manager)</i> Title: Project Leader: Start Date: Finish Date:						
Funds Requested and Future Needs:	(\$K)	Requested 03/04	04/05	05/06	06/07		Project Total
	Cash In-Kind						
	Total						
Participating Organisations:	<ul style="list-style-type: none"> ▪ ▪ ▪ ▪ ▪ ▪ 						

PART B: PROJECT INFORMATION (Normally 2 to 3 pages in length)

Background:	<ul style="list-style-type: none"> ▪ Information relevant to the project ▪ If this project is a further development/implementation of a previous R&D project, please state the project and project number
Project Statement:	<ul style="list-style-type: none"> ▪ A clear, concise statement of purpose, developed during CRC planning, which encapsulates the project objectives. ▪ It should include a methodology summary, end result and target completion date ▪ Ideally one page maximum in length
Outcomes:	<ul style="list-style-type: none"> ▪ At the end of the project, what will we have? ▪ What are the nature and estimated value of benefits to the community that will be achieved from the R&D ▪ How does this project link to the planned and approved CRC outcomes? ▪ What current constraints do we face that will be overcome/reduced? ▪ What requirements must be met?
Deliverables:	<ul style="list-style-type: none"> ▪ What are the main knowledge or tools that the Users will have at the end of this project? ▪ Be concise and specific ▪ Proposed projects must contribute to planned CRC outputs. ▪ Do they match what the agencies or community want and not want?
Background Intellectual Property:	<ul style="list-style-type: none"> ▪ Describe each piece of Background IP which is provided by each project participant ▪ Define the terms on which each piece of IP is made available ▪ Identify where the detailed documentation associated with the Background IP is held
Commercialisation opportunities and or Technology Transfer and Adoption:	<ul style="list-style-type: none"> ▪ Outline the technology transfer, adoption or commercialisation strategy for the project ▪ What issues need to be addressed?
Opportunities and Linkages:	<ul style="list-style-type: none"> ▪ What (if any) potential opportunities exist to build on the deliverable? ▪ What opportunities/linkages to other CRC projects or outside the CRC?
Project Risk Assessments:	<ul style="list-style-type: none"> ▪ What are the risks to the success of this project? ▪ Risks to consider could include technical, scientific, environmental, OHS, personnel, project management, commercial, legal, operational, financial? ▪ What problems could hinder provision of deliverables? ▪ What problems could inhibit their adoption?

PART C: PROJECT CONTRIBUTION TO RESEARCH PRIORITIES

(Tick Priorities/Objectives to which the project substantially contributes)

PRIORITY	Tick Yes	PRIORITY	Tick Yes
1. NATIONAL RESEARCH PRIORITIES⁽¹⁾ Environmentally Sustainable Australia - Water Availability		Benefits Achieved from Research Outputs - Benefits to Funding Multiplier	
- Soil Loss		- Leads to Contract Research	
- Salinity		- Publications	
- Green Industries		- Patents Possible	
- Greenhouse Gas Abatement		- Research Adoption	
- Biodiversity		- Commercialisation Options	
- Other (name)		- Other (name)	
Promote and Maintain Good Health - Healthy Start to Life - Ageing Well and Productively		Increased Value of Graduate Researchers - PhD Employed by Users	
- Preventative Healthcare		- World-Class Researchers	
- Other (name)		- New Doctorate Students	
Frontier Technologies for Industry - Breakthrough Science		- International Exchanges	
- Frontier Technologies		- International Research Collaboration	
- Advanced Materials		- Other (name)	
- Smart Information Use		Collaboration for Effective Use of Intellectual Resources - User or Researcher Secondments	
- Other (name)		- Joint Projects with Users	
Safeguarding Australia - Critical Infrastructure Protection		- Communication Processes	
- Invasive Diseases and Pests		- Multiple Participants in Project	
- Terrorism and Crime		- Project Fits User Needs	
- Defence Technologies		- Other (name)	
- Other (name)		3. BUSHFIRE CRC OBJECTIVES⁽³⁾	
2. GENERIC CRC PROGRAM OBJECTIVES⁽²⁾ Research and Innovation for Australia's Sustainable Development - Research Adoption		Internationally Renown Centre of Research Excellence	
- Technology Breakthroughs		Coordination of Bushfire Research in Australia	
- Guidelines/Models		Improved Agency Effectiveness	
- Workshops/Seminars		More Self-Reliant Communities	
- World-Class Research			
- Publications			
- Regular User/Researcher Reviews.			
- Other (name)			

PART D: PROJECT PLAN

Gantt Chart:	<i>(Please insert activity bars or milestones into text)</i>						
	Activity or Deliverable	2003	2004	2005	2006	2007	2008
	<ul style="list-style-type: none"> ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ 						
Milestones:	Deliverable			Researcher		Date	
	<ul style="list-style-type: none"> • <i>Can be combined as part of the Gantt Chart above if preferred</i> 						
Stakeholder Communication:	Who Affected?	How Affected?		Method of Communication			
	<ul style="list-style-type: none"> • <i>Who needs the output or deliverable?</i> 	<ul style="list-style-type: none"> • <i>What will it enable them to do?</i> • <i>How/when do they need it?</i> • <i>What is the best, preferred format for them?</i> 					

PART E: PROJECT RESOURCES

Staffing:	Person	Org	CRC/or Funded	Start Date	End Date	% Use
	<ul style="list-style-type: none"> ▪ <i>Researcher and User Personnel</i> 					
Equipment and Facilities:	Item	Agreed With		Start Date	End Date	% Use
	<ul style="list-style-type: none"> ▪ <i>List major/special equipment with direct impact on deliverables</i> ▪ <i>Where capital purchase is required, start date to be latest practical</i> 					

Deliverables Into Project:	Deliverable	Party	When Due?
	<ul style="list-style-type: none"> ▪ <i>Key deliverables from each participating organisation on which project success relies</i> 		
Budget:	<ul style="list-style-type: none"> ▪ <i>Attach proforma Excel Spreadsheet</i> 		

PART F: APPROVALS AND CONTRACT

Project Approval:	Person/Organisation	Signature	Date
	Project Leader: Program Research Leader: Program User Leader:		
	Users Research Committee:		
	CRC Board:		
Contract Execution:	Bushfire CRC Chief Executive:		
	Participating Organisations: 1. 2. 3. 4. 5. 6.		