

NATIONAL INNOVATION SUMMIT

WORKING GROUP
on

MANAGING INTELLECTUAL PROPERTY

FRAMEWORK PAPER

10 December 1999

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FOREWORD

The National Innovation Summit is being jointly convened by the Department of Industry, Science and Resources and the Business Council of Australia, with the active cooperation of state governments and industry groups.

The objective of the National Innovation Summit process is to identify and develop a consensus on strategies for Government, industry and the research community to improve Australia's innovation capacities.

The Innovation Summit Steering Committee has established six working groups to:

- explore Australia's national innovation system;
- identify practical policy options for presentation at the Summit; and
- assist in the development of ideas for new public and private initiatives.

This paper has been prepared by the Working Group on Managing Intellectual Property. The members of the Working Group comprise:

Mr Bruce Cutler, Chair	Freehill Hollingdale & Page
Mr Udo Buecher	BHP Steel (JLA) Pty Ltd
Dr Andrew Christie	Law School, University of Melbourne
Professor Adrienne Clarke, AO	School of Botany, University of Melbourne
Dr Ian Heath	IP Australia
Mr Robert Klupacs	Monash Institute for Reproduction and Development
Mr Owen Malone	Foster's Brewing Group Ltd
Mr Rob McInnes	Baldwin Shelston Waters Law
Mr Mark Pierce	Department of Foreign Affairs and Trade
Mr Malcolm Royal	Phillips Ormonde & Fitzpatrick
Dr Richard Sharp	Unisearch Ltd

The purpose of this paper is to undertake an analysis of all components of the Australian intellectual property system (including patents, trademarks, designs, copyright and plant breeder's rights) and identify key issues that inhibit or enhance innovation.

A series of case studies has been developed and is included at the end of the paper to illustrate the issues identified in the framework paper. The Working Group acknowledges with thanks the contributions of the case study participants.

This paper and case studies will form the basis of a public release kit and presentation to the National Innovation Summit to be held in Melbourne in February 2000.

An invitation was issued requesting interested parties to make submissions to the Working Group and a number of submissions were made from those persons and institutions who are listed in section 9 of the paper.

The Working Group acknowledges with thanks the contributions and submissions made - all submissions were considered in putting together the Framework Paper. The contribution of Charlotte Deschon, of the Queensland Department of State Development, in reviewing and collating these submissions is acknowledged.

The particular contribution of Dr Andrew Christie to the plan of the paper and in consolidating the issues identified by the Working Group is acknowledged. The Working Group commissioned George Raitt, a partner of Blake Dawson Waldron, to collect the ideas and comments of the members of the Working Group and others and to draft the Framework Paper. The Working Group wishes to acknowledge the significant contribution made by George Raitt in this important piece of work.

The contribution of Sam Steele of the Victorian Department of State Development, particularly in providing discussion on sections 1.2 to 1.5 inclusive, is also gratefully acknowledged.

This paper covers legislative, treaty and other developments affecting the IP system up to mid-November 1999.

Finally, it should be noted that the views expressed in this paper are for the purpose of discussion, and do not necessarily represent the views of particular Working Group members, their respective organisations, the Business Council of Australia or the Department of Industry Science & Resources.

Bruce Cutler,
Chair

10 December 1999

INTRODUCTION & SUMMARY OF RECOMMENDATIONS

The Working Group on the Management of Intellectual Property was established to:

- explore Australia's national IP protection system and institutional factors impacting on the management of IP;
- identify practical policy options for presentation at the Summit; and
- assist in the development of ideas for new public and private initiatives.

The purpose of this paper is to undertake an analysis of all components of the Australian IP system and identify key issues that inhibit or enhance innovation.

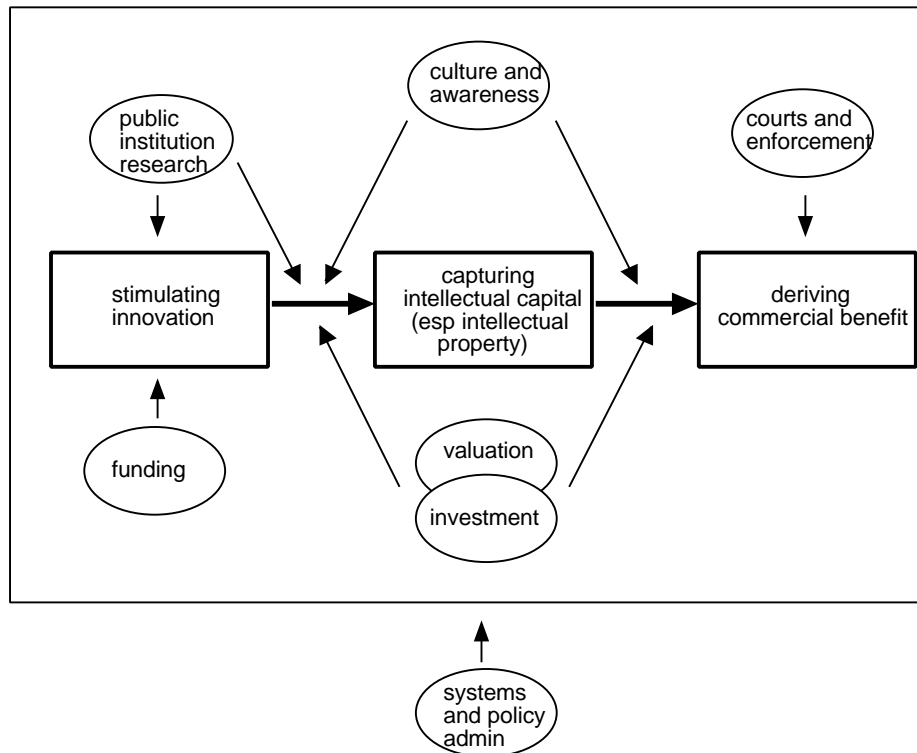
This paper sets out discussion of policy issues identified by the Working Group. However, it is beyond the scope of the present paper to undertake empirical research into impediments to innovation. The Working Group believes that, in a world of continuing technological change, there is an ongoing need for policy analysis and development of initiatives to enhance innovation. The National Innovation Summit will not be the end of the process.

The case studies illustrate the continuing need for innovation in a competitive and continually changing environment – the process does not stop with the creation of IP.

It is clear that a strong system for the protection for IP is essential to foster innovation. However, IP management raises issues that are broader than legal protection and enforcement of IP. Management impacts on an organisation's processes for the creation, assessment, protection and commercialisation of IP, and interacts with financial management or funding of IP and cultural considerations such as commitment to commercial outcomes, rewards for researchers and training in business and IP management skills.

The Working Group has focussed on the following themes relating to the management of IP in Australia: the sources and balance of funding for research; the management of research in publicly funded institutions; the stakeholders' and participants' culture and awareness of IP issues; the valuation of and investment in IP; the enforcement of IP in the Courts; and the administration of IP systems and policy by Government.

The following schematic diagram illustrates the relationship of these themes to the processes of creation, assessment, protection and commercialisation of IP.



Because significant amounts of innovation in Australia occur in publicly funded research institutions, the Working Group has devoted one section of this paper (section 2) to a discussion of the management issues of particular importance to such institutions. The matters of the sources and balancing of funding, the concept of IP valuation and the possible blockages to investment in IP are considered in the context of publicly funded institutions, but also more generally – namely, in discussions on the relationship between innovation and IP (section 1) and the stakeholders’ and participants’ culture and awareness of IP (section 3). Separate consideration is given to the administration of IP systems and policy (section 4) and the enforcement of IP in the Australian courts (section 5).

There have been numerous reports on R&D, technology uptake, higher education research, IP protection and enforcement and other aspects of the IP system over the last 10 years. Many of the initiatives proposed below for discussion at the Summit are not new. This may be a symptom of our Australian cultural stereotype of resistance to change when everything around us is already changing. This is not typical of Australian science or business, yet innovative achievements of Australians in science and business do not capture the imagination of the Australian public as, for example, sporting achievements.

This paper does not seek to duplicate discussion of issues in other reports on the subject, but does identify key issues and points of view to facilitate discussion at the Innovation Summit. The Working Group believes that the Innovation Summit provides an opportunity for working towards broad consensus among key stakeholders for decisive policy initiatives.

The Working Group believes, on balance, that the emphasis should be placed on initiatives to remove institutional impediments to the effective *management* of IP rather than initiatives to alter the IP system itself. The case studies in section 7 of the paper highlight the following issues that require effective management:

- Identifying the path to market requires bringing together a range of skills and IP beyond the initial innovation – for example, a patent for a product requires manufacturing know-how and effective marketing to develop and protect brand recognition in all relevant markets, because patents eventually expire.
- The lead time in bringing innovations to market must be minimised to effectively exploit market opportunities and enhance competitive position.
- The reality in competitive markets is that the initial innovation requires continuing research and development to remain competitive, and often a suite of patents and other kinds of IP is required for effective commercialisation.
- The key markets for commercialising Australian innovation are overseas – differences exist between the IP systems of Australia and its trading partners and will remain – these must be managed effectively.

While there are some different perspectives on the effectiveness of the Australian IP protection system, the Working Group believes that by and large the system is effective. The Working Group has nevertheless identified a number of impediments to innovation that it believes should be addressed by policy initiatives of the key stakeholders – Government, public research institutions and industry and commerce.

While the Working Group is charged also to identify aspects of the IP system that enhance competition, and believes Australia needs to more publicly value innovation and reward success, the Working Group has concentrated on addressing those issues most frequently identified. The case studies in section 7 below draw attention to successful commercialisation of Australian technology.

The first group of impediments to innovation relate to the tendency of individuals and enterprises to value only private returns when making business decisions, so they may undertake less of activities which generate spillover benefits for society than those social benefits might justify.

There appear to be a number of impediments to innovation for which policy intervention could be considered:

- public research institutions have not been able to reward researchers adequately (or in other words provide adequate incentive for successful commercial innovation) having regard to the benefit to Australia of retaining a strong pure research capacity;
- the issue of structuring incentives and rewards to individuals for innovation is one which also affects industry and commerce to some degree;
- there is an early stage funding gap for the protection of IP generated in public research institutions and for the development of IP generated in small to medium enterprises;

4.

- there is a gap in the provision of world class IP management skills in public research institutions and small to medium enterprises (nor is management of commercialisation of IP in large enterprises perfect);
- there is a gap in the provision of affordable skilled services of patent attorneys, lawyers and valuers for public research institutions and small to medium enterprises in protecting IP;
- industry and commerce does not appear to be adequately supporting research through public research institutions, having regard to the benefit to Australia.

The Working Group accepts submissions that competitive markets force firms to innovate more rapidly.¹ However, competitive forces alone will not deliver benefits to Australia if there are impediments affecting the delivery of essential inputs to innovation.

A key policy initiative to overcome such impediments is the use of tax incentives to increase returns from desirable but high risk activities. However, the issue of incentives is covered by another working group, and the scope of this paper is generally limited to policy initiatives other than of a taxation nature. The Working Group does, however, address the impediment to innovation created by the way the tax system discriminates between different kinds of IP rights.

A subset of this category is to provide funding, such as research grants, to subsidise activities or costs which might not otherwise be funded. Some commentators believe that it makes little sense to fund research without providing funding for IP protection or early stage commercialisation activities. Existing and recently announced programs that address this are mentioned in section 1.8 below.

A second kind of initiative to overcome such impediments is to ensure that persons who generate spillover benefits can appropriate to themselves a greater benefit than the market mechanism would otherwise allow. This is the role of IP laws. Because IP is usually exploited in international markets, it is generally accepted that international cooperation is required to extend existing IP protection. For example, the extension of patent terms from 16 to 20 years in accordance with the World Trade Organisation Agreement on Trade Related Aspects of Intellectual Property Rights ("**TRIPS**").

A subset of this category of initiative is the way in which rewards from commercialisation of IP are shared between organisations and researchers. While this is in part a human resources issue, beyond the scope of this paper, the IP system impacts on the relative interests of employers and employees in IP and the rewards from commercialisation. These institutional aspects are dealt with in section 2.1 below.

A third kind of initiative to overcome such impediments is to improve the flow of information and awareness of relevant issues to improve the operation of the market.

The Working Group also accepts submissions made to it that applied research which is driven by commercial rather than academic or bureaucratic priorities is essential to foster

¹ Submission of Australian Chamber of Commerce and Industry.

innovation, and that Government should support pure research through public research institutions,² but both kinds of research need to be supported by Government to provide spillover benefits to society which market forces would not otherwise deliver.

The second group of impediments to innovation relate to distortions in the Australian IP protection and tax system that adversely affect international competitive neutrality. A competitively neutral IP system is one that does not distort economic decisions by Australians or foreigners to undertake innovative activity in Australia or to protect and exploit IP here.

The Working Group addresses a number of respects in which the Australian IP system may not be competitively neutral compared with overseas systems.

The Working Group regards the TRIPS Agreement as establishing a minimum base. Australia must continue to encourage major trading partners to implement minimum standards for IP recognition and protection, to ensure Australian firms can exploit Australian innovations overseas (see section 1.5). On the other hand, to compete with other countries for commercial research and development funding, Australia's IP system must be competitive with the systems of leading technology nations. While the likely admission of China to the World Trade Organisation would be a positive step, to create a level playing field internationally for the exploitation of Australia's IP it will be necessary to continue to encourage all trading partners to implement TRIPS if they have not already done so.

As noted above, the Working Group believes that the IP system in Australia is generally effective. While there is no major impediment, there are some matters of fine-tuning that could usefully be addressed.

There appear to be a number of respects in which the Australian IP system provides less favourable protection for innovation than comparable systems of leading nations, because the Australian system has:

- Less stringent tests for patent grant and more stringent tests for validity and enforceability, which create less certainty and predictability.
- Less certainty and predictability due to the operation of the Trade Practices Act and administrative discretions of the ACCC.
- Tax laws concerning deductions for R&D expenses and writing off capital costs which discriminate between different kinds of IP rights and distort decisions involving technology transfer from tax loss start-up companies and public research institutions.
- Less certainty and predictability due to the process for determination by Courts regarding patent validity.

² Submission of Australian Chamber of Commerce and Industry.

The issue of patent validity requires the Courts to weigh up facts and circumstances to decide whether the protection of the law ought to be awarded to an invention in each particular case.

This paper sets out a number of possible policy initiatives for the purpose of discussion at the Innovation Summit to address the impediments to innovation noted above.

The Working Group recommends that key initiatives be considered in the following areas of priority (more detailed recommendations are set out in section 6 of the paper):

- A. Initiatives to improve the management of IP in private enterprise of all sizes and in public research institutions – recognising the link with IP ownership policies and reward and incentive schemes which encourage innovation by individuals (see further recommendations 6, 7 and 8 and the case studies). This requires improving the understanding of IP issues by researchers and IP managers and importantly the commercial and strategic use of IP in accordance with world best practice – recognising that we must compete with leading technology nations and that these nations often constitute the key markets for commercialising Australian technology. A key initiative could be Government support/incentives to expand the quality, depth, scope and international benchmarking of dedicated IP, technology and commercialisation management courses in tertiary institutions.
- B. Initiatives of a legislative nature to fine-tune and continually develop the IP system in a timely way, recognising that effective coordinated policy analysis and development across all kinds of IP is an ongoing imperative (see further recommendations 1 and 2). A key initiative to give IP the priority it deserves would be the establishment of a high-level peak Government body to coordinate, oversee and drive IP policy in Australia. A further key initiative would be to establish an independent IP research centre, funded by Government and/or industry, to provide multi-disciplinary input into IP policy formulation and to carry out ongoing empirical research in a number of areas that the Working Group has not had the resources to address in detail.
- C. Initiatives to encourage community awareness of IP and recognition of the value of innovation and risk-taking (see further recommendation 8). An important and achievable symbolic gesture in this area could be the coordination and enhancement of the existing award system recognising outstanding innovation in Australia. This could involve enhanced funding by Government and/or industry, and an annual presentation by the Prime Minister. The Working Group believes that overt recognition at the highest level of the importance of innovation to Australia's future economic performance is critical to facilitate the necessary cultural/mindset shifts.

TYPES OF INTELLECTUAL PROPERTY

The following brief outline of the system of IP protection is provided to facilitate discussion of the issues raised in this paper by a wide audience. Readers familiar with these matters may skip over this section.

IP protection is of two kinds: first, where registration is required to gain protection (such as patents, registered trade marks, circuit layout rights, registered designs and plant breeder's

rights); and second, where protection is conferred automatically by law (such as copyright, common law trade marks, confidential information and trade secrets).

Patents

Patent rights are conferred under the *Patents Act 1990*. The invention may be either a product or a process of manufacture. Patent protection is granted to inventions that:

- are novel in the sense that there is no indication that the invention has already been published or publicly used;
- involve an inventive step in the sense that the invention would not have been obvious to a person knowledgeable in the particular field applying general knowledge to the particular problem;
- have a potential use.

Patents protect an invention from copying or independent creation. Patent protection is obtained through a registration process where the details of the patent including technical information are placed on a public record. A patent gives the patentee the exclusive rights to exploit his or her invention for a period of 20 years from the date of the patent in Australia.

Trade marks

Trade marks may obtain statutory protection through registration under the *Trade Marks Act 1995*. A trade mark is a sign such as a word, brand, label or other symbol used to distinguish the goods or services of a person from the goods or services of others. To be registered a trade mark must be capable of becoming distinctive. Trade marks may be registered under the Trade Marks Act as trade marks, certification trade marks, collective trade marks, or defensive trade marks.

A registered trade mark gives the proprietor the right to exclude others from using the mark in relation to the goods or services for which it is registered.

A trade mark is initially registered for 10 years but may be renewed. There is no prescribed limit on the life of a registered trade mark.

Unregistered trade marks are protected at general law by an action for passing off or an action under Section 52 of the Trade Practices Act ("**TPA**") for misleading or deceptive conduct.

Circuit layout rights

Eligible circuit layout rights are granted under the *Circuit Layouts Act 1989*. These rights are a copyright style of IP right for original layouts of integrated circuits (computer chips). A layout is the three-dimensional plan of the electronic components comprised in the computer chip.

The rights comprise the right to make an integrated circuit in accordance with the layout and to exploit the layout commercially in Australia, as well as the right to copy the layout, directly or indirectly, in a material form.

The duration of the right is 10 years after creation and, if it is commercially exploited within that time, a further 10 years from that time.

Registered designs

Design protection is granted under the *Designs Act 1906*. Design protection is granted over the appearance of articles but does not include protection of a method or principle of construction. Design protection is gained through a registration process and is only available to new or original designs. Design registration gives the owner the exclusive right to apply the design to the registered articles. Design rights are conferred for an initial period of one year, renewable for a maximum period of 16 years.

Plant breeder's rights

The *Plant Breeder's Act 1994* provides protection for new plant varieties, except for trees and vines, for a period of 20 years. In the case of trees and vines the period is 25 years. The Plant Breeder's Act provides for the granting of exclusive proprietary rights to breeders of certain new varieties of plants and fungi. The owner of a plant variety that is registered under the Plant Breeder's Act has the exclusive rights to produce, sell, import and export the plant. The Plant Breeder's Act reflects the Government's obligations under the International Convention for the Protection of New Varieties of Plants.

Copyright

Copyright is conferred under the *Copyright Act 1968*. In contrast to patents, copyright only protects original expressions in material form, not underlying ideas. The materials protected by copyright are literary, dramatic, musical or artistic works and films, sound recordings, broadcasts and published editions. Copyright subsists automatically on the work being produced. There is no requirement for registration.

Copyright gives the copyright owner a number of exclusive rights, including the right to reproduce, publish, perform, broadcast, transmit and adapt the work for a period provided for in the Act. For published works this is the life of the author plus 50 years.

Confidential information and trade secrets

Confidential information, trade secrets or "know-how" are protected at general law by an action for breach of confidence. Such rights do not protect the owner against independent creation by others, and rights cease once the information is in the public domain.

ISSUES

1. RELATIONSHIP BETWEEN INNOVATION AND IP

1.1 Economics of innovation

Issues

Does our IP protection system provide sufficient economic incentive for innovation? Are there tensions between IP law and competition law that need to be addressed? Should the

economic power of holders and users of IP rights be regulated? Do competition law requirements adversely impact on the capture or commercialisation of IP?

Discussion

While competitive forces provide incentives to undertake R&D and innovate, economists agree that activities such as R&D and innovation create spillover benefits for society. Because enterprises will only value private returns when making business decisions, they will undertake less of these activities than would be justified by the spillover benefits, so the potential benefits may not be fully captured for society.³

Economists recognise that innovation, technological change and economic growth are stimulated by the prospect of deriving exclusive profits from IP.⁴ A recent evaluation of the economic value of IP undertaken by Rogers⁵ concluded that, in spite of considerable variations across firms and industries, IP rights have significant private benefits. Rogers' key findings include:

- the value of holding the patent stock in a year is equivalent to a 10-30% R&D cash subsidy;
- survey data on Australian firms in the late 1970s indicated that the loss of patent protection would cause R&D to fall by 7-12%;
- the ideas associated with IP rights have substantial value. For example, one Australian study indicated that an additional patent or trade mark application increased a firm's market value by \$7 million and \$1.4 million respectively;

Rogers has less conclusive evidence regarding spillover benefits but suggests that knowledge spillovers from patent disclosure may have a small effect in increasing R&D, and that there are clear correlations between high levels of patenting activity and high technology exports, foreign direct investment inflows and productivity growth.

A variety of measures are available to Governments wishing to encourage innovation, from the IP protection system itself to tax concessions and Government research grants.⁶ The focus of this paper is on the management of IP, however, in section 1.8 below there is a discussion of distortions in the tax system that impact on the management of IP.

In contrast to tax concessions and Government grants, which focus on inputs, patent and other IP protection rewards results of innovation.⁷

³ David Mortimer, Report of the Review of Business Programs (Mortimer Report) "Going for Growth" June 1997, p 99.

⁴ BIE, "The Economics of Patents", Occasional Paper No 18, 1994, p 6.

⁵ Mark Rogers, "The Economic Value of the Intellectual Property System", May 1999, pp 3-4.

⁶ BIE, 1994, p 12.

⁷ BIE, 1994, p 13.

Patents confer exclusive rights of use for a fixed term of years, in return for publication of the invention, and after the expiry of the patent the invention may be used freely. This contributes to spillover benefits while encouraging innovation, and is to be contrasted with protection of unpatented know-how, which continues as long as the know-how remains secret.⁸ However, studies suggest that the lack of detailed disclosures in patent specifications limits their usefulness in diffusing innovation, and patent licences almost invariably include licences of unpatented know-how.⁹

Some economists consider that the main economic issue with patents is one of inadequate rewards rather than excessive windfall gains from patent protection (evidence suggests that some patents can be "invented around" in a relatively short space of time), so it is argued there is no conflict between patent law and competition law.¹⁰

The TPA exposes the ownership and use of IP to competition law, but provides certain limited exemptions for conditions in licences or assignments relating to IP or subject matter produced using IP. The exemption does not apply to abuse of market power or re-sale price maintenance. The exemption does not apply to refusals to grant an IP licence. The scope of the exemption has not been pronounced upon by the Courts, and current interpretation is based on guidelines issued by the Australian Competition and Consumer Commission ("**ACCC**").

Even if certain use of IP may be anti-competitive, the ACCC has limited discretionary power to authorise conduct that results in an over-riding public benefit. However, the ACCC cannot authorise conduct that would amount to an abuse of market power.

The National Competition Council recently conducted a major review of the IP and other exemptions. The Council acknowledged the significance of securing the benefits of commercialisation of innovation for Australia, and the commercial importance of certain licensing conditions.¹¹

The Council recommended in March 1999 that:¹²

- (a) the IP exemption be amended to remove protection of price and quantity restrictions and horizontal agreements;
- (b) it may be valid to continue the exemption for particular types of licensing conditions such as exclusive licences, territorial restrictions and clauses requiring best

8 BIE, 1994, p 5.

9 BIE, 1994, pp 31-32.

10 BIE, 1994, pp 44-45.

11 National Competition Council, p 151.

12 National Competition Council, "Review of Sections 51(2) and 51(3) of the Trade Practices Act 1974", Final Report, March 1999, p 11-12.

endeavours to promote the licensed technology to provide certainty for IP owners and users;¹³

- (c) the IP exemption be extended to cover plant breeder's rights and trade marks in respect of services;
- (d) the ACCC formulate guidelines to assist industry distinguish between IP licences and assignments that might be:
 - exempted from the TPA;
 - breach the restrictive trade practices provisions;
 - breach the restrictive trade practices provisions, but be eligible for authorisation by the ACCC.

The Council regarded IP rights as exclusive property rights like any other, rather than legal or economic monopolies, and did not consider there to be any clash between IP rights and competition law. The Council considered there would only be rare cases where holders or users of IP rights would have sufficient market power to raise competition law issues, because generally there are viable substitute products or processes available from competing IP.¹⁴ The Council recognised that certain types of leading edge new technology may exist in their own markets, creating strong market power and making IP owners and users vulnerable to breaching the TPA.¹⁵ However, some kinds of IP such as designs and trade marks could rarely give rise to a sufficient market power.¹⁶

The Council considered a number of licensing scenarios, such as the grant of exclusive licences, where differences of opinion might result as to the application of competition law.¹⁷

The Council considered that the principal benefit of the IP exemption is to provide greater certainty in which IP licensing may take place. The Council noted submissions that an exemption is necessary to provide certainty for commercial investment in R&D because commercialisation rights are frequently granted before research commences, at which time it is very difficult to assess the future impact on competition.¹⁸

To the extent the exemption does not apply, ownership and use of IP may have anti-competitive effects which offend against competition law. To an extent the ACCC has a

13 National Competition Council, pp 182-186 and 209-213: the Council accepted, in the absence of clear judicial authority, the interpretation of the TPC in its 1991 Background Paper, "Application of the Trade Practices Act to Intellectual Property".

14 National Competition Council, pp 149-150, 157-166, 171-172.

15 National Competition Council, p 195.

16 National Competition Council, pp 216-219.

17 National Competition Council, pp 174-176.

18 National Competition Council, pp 193-196.

discretion to apply public benefit criteria to authorise anti-competitive conduct. However, the ACCC has no discretion regarding licensing or assignment of IP which takes advantage of substantial market power for a proscribed anti-competitive purpose.

Accordingly, there will be situations where the TPA does not apply, or where the Court determines whether exercise of IP rights is anti-competitive or where the ACCC may grant relief if it is satisfied there is overriding public benefit.

The Microsoft case in the US illustrates the difficulties of assessing whether in economic terms market share amounts to market dominance.¹⁹ The case also illustrates the length of time required for Courts to determine these issues, and the recent appointment by the Court of a mediator to mediate between the Justice Department and Microsoft on the outcomes of the case suggests that Courts may not be the best forum for weighing up the policy issues involved.²⁰

The Government established the Intellectual Property Competition Review Committee in June 1999 to review the NCC recommendations in the context of a wider consideration whether the social benefits of the restriction on competition resulting from legislation protecting IP rights outweigh the costs, and whether the objectives of IP legislation can be achieved by non-legislative means.²¹

The Committee circulated an issues paper in September 1999 which thoroughly analyses the economic issues concerning competition law and IP law, including Australia's obligations under TRIPS and other international treaties concerning IP.²² The Department of Industry Science & Resources provided a wide-ranging submission to the Committee in November 1999.²³

For discussion of international harmonisation issues see section 4.6 below.

Possible initiatives

- legislative amendment of the TPA to apply the IP exemption evenly across all relevant kinds of IP.
- review the ACCC/NCC interpretation of the IP exemption to determine whether, having regard to the likelihood of it being upheld by a Court, legislative amendment is desirable to provide certainty for enterprises wishing to invest in innovation as owners and licensees of IP.

¹⁹ *United States v Microsoft*, US District Court for the District of Columbia, Findings of Fact, 5 November 1999 ("<http://usvms.gpo.gov/findfact.html>").

²⁰ Australian Financial Review, "Sudden Twist in Microsoft case", 22 November 1999, p 31.

²¹ Press Release dated 24 June 1999 and terms of reference ("<http://www.ipcr.gov.au>").

²² Intellectual Property Competition Review Committee, Issues Paper, September 1999 ("<http://www.ipcr.gov.au>").

²³ Department of Industry Science & Resources, "Submission to the Intellectual Property and Competition Review", November 1999.

1.2 Trends in R&D expenditure

Issues

What are the trends in Australia and overseas? Is this a useful indicator of the level of innovation? What are the trends by industry sector?

Discussion

There is widespread recognition amongst economists and Governments of the importance of business expenditure on R&D ("**BERD**") in relation to innovation and that there is a role for Governments to play in supporting the R&D efforts of firms because of the significant spillover benefits that result.²⁴

However, in spite of this recognition and the commitment of public funds by the Australian Government through tax concessions and grants to support R&D, Australia has not performed well by OECD standards in the level of R&D undertaken.

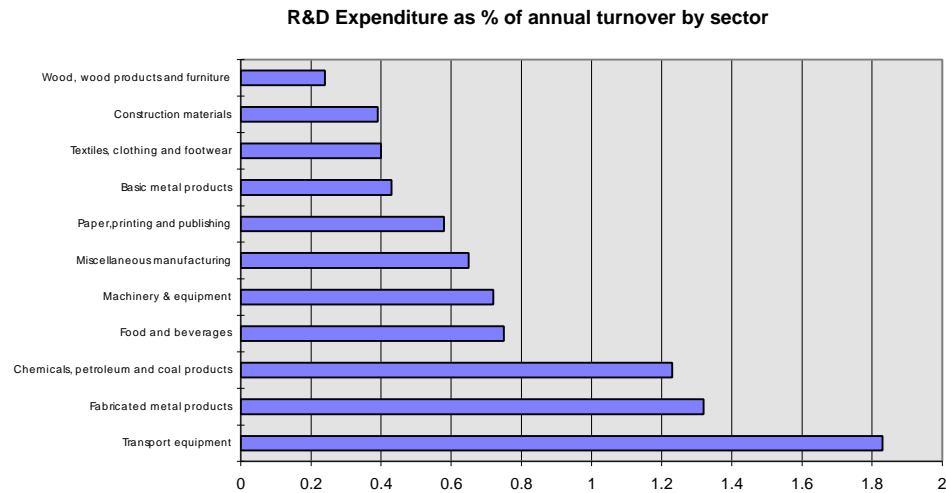
It is estimated that in 1998/99, Australia will devote \$8.4 billion to its total R&D effort. This is 0.5% of its \$1.65 trillion revenue or 1.4% of its GDP.²⁵ Further, although BERD steadily increased during the first half of the decade, there has been a decline in the last two years, from a peak of \$4.34 billion (0.86% of GDP) in 1995/96 to \$4.04 billion (0.72% of GDP) in 1997/98.²⁶

The Ai Group/PriceWaterhouseCoopers Survey of Australian manufacturing provides some useful data regarding the nature of R&D activity according to size of firm and industry sector. Broadly, there appears to be no strong relationship between the size of firm and the proportion of turnover devoted to R&D (as opposed to the size of firm and the overall amount of R&D performed). However, there is considerable variation between sectors in the concentration of R&D performance, as Chart 1 below shows:

²⁴ The argument in favour of Government support for BERD is outlined in detail in the Industry Commission Report on R&D, 1995, Vol. 1, pp161-81

²⁵ Melbourne Institute of Applied Economic and Social Research, "R&D and Intellectual Property Scoreboard 1999", p.3

²⁶ ABS Cat. 8104.0 "Research and Experimental Development Businesses 1997/98.



Source: Ai Group, "Trends in Research and Development Expenditure in Australian Manufacturing", August 1999, p.7

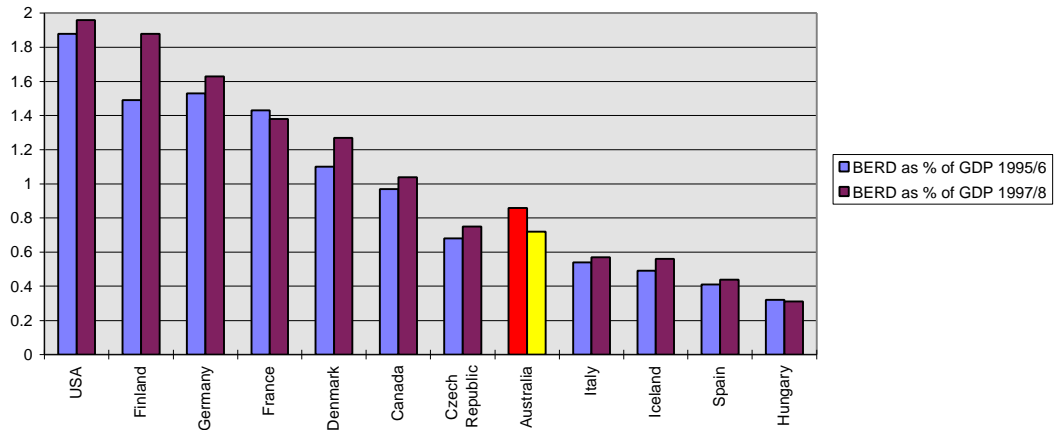
This analysis shows a correlation in R&D intensity and the strength of the global linkages within the industry. Clearly, Australia's automotive industry is pre-eminent in this regard and this is reflected in the sector's high R&D concentration. The food industry, by contrast, has a below average concentration of R&D, although it accounts for the highest overall level of manufacturing R&D expenditure.

Also of interest from the survey are the trends in R&D performance and the reported reasons why firms performed more or less R&D. Overall, some 26% of firms surveyed reported an increase in R&D and 23% reported a decline between 1995/6 and 1998/9. The balance reported no change, which represents a decline in real terms, allowing for inflation. Three quarters of firms reporting increased R&D indicated that the chief reason for the increase was product development to expand markets and increase competitiveness. Profit pressure was cited as the main reason for cutting R&D expenditure by almost half the firms reporting a decline. The reduction of the R&D tax concession was also a significant factor for a quarter of these firms.²⁷

The trends in R&D performance in Australia are in stark contrast with those occurring overseas. Chart 2 indicates that while there has been a significant decline in BERD in Australia, it is increasing in most of our competitor nations, or at least remaining steady.

²⁷ Ai Group, "Trends in research and development expenditure in Australian manufacturing", August 1999.

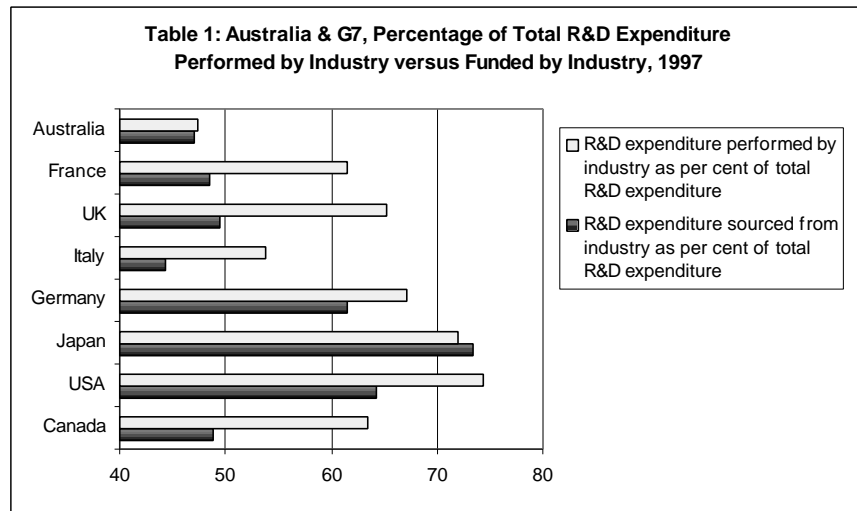
Chart 2. OECD trends in BERD



Source: Australian Bureau of Statistics, "Research & Experimental Development Businesses 1997/98", June 1999.

Whilst this decline may in part be due to particular prevailing conditions affecting Australia (e.g. the economic downturn in Asia), it is clear that we can ill afford for this trend to continue. Australia currently ranks 12th out of the OECD nations in terms of BERD as a percentage of GDP and this ranking will quickly drop on current trends.

Table 1 compares Australia's performance and funding levels of R&D by industry with those of the G7 nations. This table indicates that Australian industry actually funds a similar proportion of total R&D expenditure to that of a number of G7 nations, however its own performance of R&D is considerably lower than G7 nations. These figures suggest that whilst Government efforts to stimulate collaboration between industry and research institutions (e.g. the CRC Program and the requirement that CSIRO source 30% of its research funding from industry) are having some impact, government incentives for R&D performed by industry are inadequate.



Source: OECD, 1999, *Science, Technology and Industry Scoreboard: Benchmarking Knowledge-based Economies*, p126, p128

In the next section the sectoral correlation between BERD and patent figures is examined. It appears these two indicators give a reasonably clear picture of the levels of innovation within industry sectors.

Possible initiatives

- examine industry sectors with low R&D intensity, particularly those with export potential, to see where measures to increase R&D intensity and to more effectively manage IP would best be targeted.

1.3 Use of IP in Australia

Issues

What is the take-up and the trends in the take-up of IP rights by Australian companies in the various industry sectors? Does this match the industry sector profile of R&D spending?

Discussion

The performance of R&D is not the only measure of innovation. As mentioned in the *R&D and Intellectual Property Scoreboard 1999*, the overall innovation performance of the economy depends on incentives, education, financial resources and government policies and that the uptake of IP by firms is as crucial as their R&D in measuring their overall level of innovation.²⁸ That study therefore proposed a comprehensive model for measuring innovation by firms that encompasses the uptake of patents, designs and trademarks.

Patents

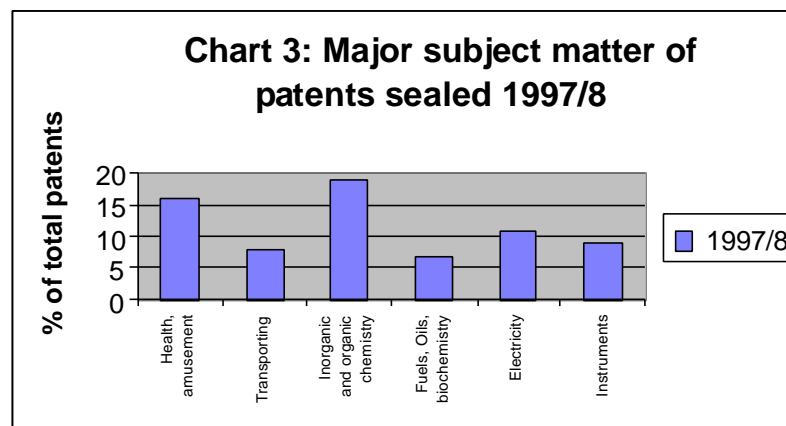
²⁸ Melbourne Institute of Applied Economic and Social Research, "R&D and Intellectual Property Scoreboard 1999", p.10.

An examination of Australian IP statistics²⁹ indicates that total patent applications have almost doubled between 1991/2 and 1997/8 (27,217 to 52,118). However, this does not indicate a major increase in the number of patents being taken out by Australian firms or individuals. Rather, this growth is entirely due to international applications designating Australia under the Patent Cooperation Treaty ("PCT") which rose from 11,500 to 38,380 during this period. This does not indicate an increased interest in Australia, just an increased use of PCT applications which cover multiple countries. To measure trends in overseas interest in Australia it would be necessary to look at PCT applications which enter the national phase.

Other applications have in fact dropped from 15,717 in 1991/2 to 13,738 in 1997/8. Moreover, of the 6,956 completed patent applications in 1997/8, only 1,627 (23%) were to Australian resident applications. This proportion has not altered significantly in recent years (1,585 or 22% in 1994/5).

The reason for this low level of Australian resident applicants is due largely to Australia's industry structure, with its high number of large multinational firms which dominate patent applications. The *R&D and Intellectual Property Scoreboard 1999* indicates that the leading patenters in Australia in 1996 were all multinationals: Proctor & Gamble, 3M, Ericsson, BASF, Bayer, Motorola, Nokia, Rhone-Poulenc, Merck and Hoechst.³⁰

This list also provides some clues as to the major industry sectors involved in patenting, although a sectoral analysis of patenting rates is difficult to compare accurately with trends in BERD because of different systems of classifying industries used by IP Australia and the ABS. However, Chart 3 below gives some indications as to the major fields in which patents are used. The 1997/8 data shown below is consistent with previous years.



Source: IP Australia, *Industrial Property Statistics, 1997/8*

²⁹ IP Australia, *Industrial Property Statistics, 1994/95 – 1997/98*.

³⁰ Melbourne Institute of Applied Economic and Social Research, "R&D and Intellectual Property Scoreboard 1999", p.9

As would be expected, the sectors that most closely relate to pharmaceutical and medical R&D are most prominently represented. Areas relating to transport and electronics, two of the most dominant areas of BERD growth, also figure strongly in this data. Overall, it can be assumed that there is a significant correlation between BERD and patent figures, allowing for the inherent patentability of certain sectors, and that combined, these two indicators give a reasonably clear picture of the levels of innovation within industry sectors.³¹

Government enterprises – including CSIRO and the universities – made 36.5% of patent applications in Australia in 1996.³²

Trade Marks and Designs

Another source of data contained in the IP statistics is the uptake of trademarks and designs. A total of 24,534 trade marks were registered in 1997/8, an increase of 98% on 1991/2. The major subject areas were again consistent with the major areas of BERD, with food and beverages, and various forms of machinery and scientific/commercial equipment being prominent categories. Various services also accounted for nearly a third of registered trade marks, reflecting the growing prominence of the services sector in the economy, whilst sectors such as textiles, clothing and footwear figure strongly, as would be expected in this form of IP protection.

A total of 3,721 designs were registered in 1997/8, an increase of 23% on 1991/2. As with trade marks, the prominent sectors tend to reflect the nature of the IP being protected, with building and construction, packaging, tooling, transport and furnishing being the most strongly represented.

Australia was the country of residence of 60% and 67% of applicants for trade marks and designs respectively, significantly higher levels than for patent applicants.

Copyright

Unlike the forms of IP protection discussed above, copyright is freely and automatically applied. Copyright covers works of art, literature, music, films, sound recordings, broadcasts and computer programs.

There are two difficulties in factoring copyright into this discussion. One relates to the categories of intellectual property that are covered by copyright. It has been argued that copyright relates only to areas of literary or artistic creativity, and does not cover areas of "industrial property".³³ Its relevance to a discussion on industrial innovation is therefore minor.

The other difficulty is that, unlike patents, trade marks and designs, copyright is not formally registered. Accordingly, there are no official statistics that can be used to gauge the influence of this

³¹ Simon Feeny and Mark Rogers, "The Use of Intellectual Property by Large Australian Enterprises", Melbourne Institute of Applied Economic and Social Research, Paper for IP Australia, October 1998.

³² Ibid.

³³ Office of the Chief Scientist, "The Role of Intellectual Property in Innovation", Strategic Overview, Volume 1, 1993, p 5.

form of IP protection on innovation. Equally, there are few references to it in the literature on this subject.

That said, it can at least be stated copyright is the major form of IP protection for some important innovative Australian industries, such as computer software, which have developed strongly in recent years. The extent to which the strength of our copyright laws have assisted such sectors is difficult to determine in the absence of any detailed data.

From the above data, it can be reasonably concluded that there are some substantial correlations between Australia's BERD profile and the sectoral uptake of IP protection, allowing for the tendency of certain types of IP protection to suit particular sectors. It can also be concluded that there are high levels of international participation, particularly in patent applications. This reflects both the strong presence of multinational companies in Australia, as well as the increasingly global nature of economic activity which developments such as the Patent Cooperation Treaty are facilitating.

Possible initiatives

- examine industry sectors with low intensity use of IP protection by Australian enterprises to see where measures to more effectively manage IP would best be targeted.

1.4 Overseas trends in use of IP

Issues

What is the take-up and the trends in the take-up of IP rights overseas? Does this match the profile in Australia?

Discussion

The growth of international trade and investment has had a corresponding effect in the rise of international IP protection. The rapid economic integration at the global level is raising demands that national IP systems be similarly integrated in order to overcome what are felt to be barriers to an environment that is fully conducive to innovation. Indeed, in most OECD countries, the majority of patent applications are in fact filed by non-residents, the ratio being 1.88 to 1 overall in 1994 (Australia was 3.07 to 1 in the same year).³⁴

This trend is being driven in part by the Patent Cooperation Treaty which seeks to simplify patenting arrangements across jurisdictions, and by the establishment of a number of regional (as opposed to national patent offices). However, it appears to reflect the growing desire of firms to develop global marketing strategies. As such, small differences between patent systems in various jurisdictions can be a great source of difficulty to these firms.

Patenting within different countries varies considerably with the rate of applications in OECD countries varying from 0.02 to 127.92 per 1000 of population, with a median value of 1.98. Where levels of industrial activity are similar, differences within the patenting systems can

³⁴ OECD, *Patents and Innovation in the International Context (OCDE/GD(97)210, 1997*,p.10.

account for these large variations in patenting rates. In summary, although there is an overall trend towards globalisation within patenting activity, individual systems are still very influential in determining patenting trends.

By comparison, Australia's rate is about 2.8 per 1000 for total patent applications and about 0.7 for applications by Australian residents.³⁵ In terms of OECD ranking, both our levels of BERD and patenting put us in the "middle of the pack". However, it needs to be remembered that much of our BERD and patent activity are conducted by multinational companies, and that there are some firms which individually undertake more global R&D than Australia's entire level of BERD.

The advance of technology has also had a profound impact on global IP arrangements. The key impacts that this has had are:

- firms rather than individuals becoming increasingly the predominant applicants for patent protection;
- widening of the scope for patent protection to many new technological areas, with numerous attendant problems in implementation (for example, computer software, traditionally protected by copyright rather than patent, is becoming increasingly integrated with hardware, whilst programs, as opposed to software, are being regarded as patentable);
- in biotechnology, issues regarding the patentability of genetic engineering and isolation of genes;
- the effect of growing public information networks for the diffusion of knowledge, such as the Internet, in diminishing the effectiveness of patent protection.

The WTO Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPS"), established in 1995 on the conclusion of the Uruguay Round of multilateral trade negotiations, has gone a long way towards resolving issues of variation between systems. However, some problems still remain, which, in an increasingly borderless global economy, may act as disincentives for firms to undertake R&D or conduct trade within particular jurisdictions. TRIPS made no inroads on the critical anomaly in IP protection in the developed world, namely the US "first to invent" rule. There are also major variations in the biotechnology field because TRIPS allowed optional levels of protection in this area – which is the major growth area of patenting activity worldwide. It also left geographical indications as an unfinished agenda.

TRIPS did not rule out variations in the operation of patent systems in individual countries. These include:

- differences between "first-to-file" and "first-to-invent" patent systems;
- differing inventive step requirements;
- differing disclosure provisions;

³⁵ Based on IPAustralia Industrial Property Statistics, 1997/8 and assuming a population of 18.5 million

- varying duration of patents, an issue particularly for industries with long development cycles such as biotechnology and pharmaceuticals;
- interpretation of claims;
- institutional profiles and procedures.

For firms relying on copyright protection, for example, there are still considerable risks in exporting to countries with minimal copyright protection, because of the ease with which their products can typically be copied, despite improvements made under the TRIPS Agreement.³⁶

The overall WTO package of international trade agreements, including TRIPS, is to be developed further in a planned new round of multilateral trade negotiations, to be launched at the Third WTO Ministerial Conference in Seattle during November 1999.³⁷ The TRIPS Agreement is due to be reviewed in its entirety in 2000. This review will entail an exchange of information about implementation, and may lead to negotiations on substantive intellectual property matters, either renegotiation of its existing provisions or consideration of new issues. Some form of review will proceed whatever the outcome of the Seattle Conference.

The WTO TRIPS Council has already commenced specific reviews on:

- biotechnology intellectual property, specifically the protection of plant and animal inventions, through patents and sui generis systems;
- national systems for the protection of geographical indications (such as 'Burgundy' for wine and 'Stilton' for cheese);
- a possible multilateral system for notifying and registering geographical indications;
- the scope and nature of trade-related intellectual property disputes that countries can raise under the binding WTO dispute settlement system;
- application of the TRIPS rules to electronic commerce.

Some commentators believe that Australia can be regarded favourably in terms of the consistency of its IP regime with most advanced economies. Our IP legislation is strongly influenced by our commitment to WIPO conventions and agreements and the requirements of TRIPS.³⁸

The important issue arising from this analysis is that of the links between IP and innovation and how some of the global trends outlined above may be influencing this.

³⁶ Freehill Hollingdale & Page, "An International Perspective: Protecting Intellectual Property in the Global Arena – Trends and Current Aspects", Paper given by Wayne Condon, IP Partner, November 1994, p.5.

³⁷ Department of Foreign Affairs & Trade, "Intellectual Property – A vital asset for Australia – a background briefing paper on the review of the TRIPS Agreement", November 1999.

³⁸ Intellectual Property and Competition Review Committee, Issues Paper, September 1999, p.7

The BIE says overseas studies of patent protection suggest that patents play a minor but significant role in the innovation process, with large variations according to the field of technology.³⁹ The BIE concluded that estimated private returns from patent protection account on average to between 15% and 30% of private R&D costs. More recently, Rogers⁴⁰ judged that the patent system offers an equivalent stimulus to private innovation as would a 10-30% cash subsidy to R&D.

There is of course considerable variation between industry sectors in their reliance on patents, as opposed to other forms of IP protection. A general rule of thumb that can be applied from international trends is that there is an increasing uptake in patent applications in high-tech areas and that there is a greater likelihood of patent application in sectors with high levels of R&D investment.⁴¹ However, there are other factors involved. For example, studies indicate that patents are less often used to protect processes because without patent disclosures process innovations can be kept secret for a longer time. Products that can be easily reverse engineered will more likely be covered by patent protection.

A number of international surveys indicate a strong increase in firm preference for either secrecy or lead time over patents in protecting their IP.⁴² In these cases, patents may also be used but their value relative to the overall innovation will be lower. The studies indicate that firms may be concerned with various key drawbacks with patents, such as:⁴³

- competitors legally invent around them;
- patents may be held invalid if challenged;
- only novel products and processes are patentable;
- patent documents disclose too much information;
- technology may be moving so fast patents are irrelevant.

A key concern underpinning the above is believed to be the growing legal costs associated with patents. Given the growth in globalisation, it can be assumed that this trend will continue, since international patent protection raises considerable additional complexities and potential costs. The BIE noted in 1994 that, although there is considerable variation between jurisdictions, the costs of patenting were then generally rising globally, raising the issue of whether the protection gained warrants the expense.⁴⁴ Furthermore, when much

³⁹ BIE, 1994, pp 24-25.

⁴⁰ Rogers, M, "The Economic Value of the Intellectual Property System. A review of empirical studies on the costs and benefits of the intellectual property system". Paper for IP Australia, May 1999, p.3

⁴¹ OECD, Patents and Innovation in the International Context, OCDE/GD(97)210, 1997, p.23

⁴² Ibid.

⁴³ BIE, 1994, p 26.

⁴⁴ Ibid.

innovation is taking place through incremental improvements, firms are faced with the prospect of having to patent each step.

Since then there have been significant fee reductions in Patent Offices in some countries, such as Europe, the US and Australia.⁴⁵

However, the studies suggest that patents facilitate commercialisation (and presumably commercial funding) because they provide a clearly defined legal framework.⁴⁶ Indeed, many firms are realising the value of patents as strategic assets and are actually increasing their patenting activity. One typical strategy adopted by such firms can involve "reserving" or "blocking" certain technical areas by the use of multiple patents built around the key invention or product. A recent US survey found that 82% of respondents indicated that this tactic was a motive for patenting.⁴⁷

This in turn has raised the demand by jurisdictions that patent owners be obliged to work their patents in return for protection. If such a demand were enforced, the attractiveness of patents in those jurisdictions would be reduced and a greater trend towards secrecy would probably occur.

Another emerging strategy is the use of patents as mechanisms to negotiate licensing or alliances with competitors rather than undertake direct exploitation of the invention or product.⁴⁸ In other words, IP is increasingly being regarded as a high value intangible asset and firms are using their IP strategically to maximise sustainable income growth through utilisation of the full range of IP protections.

1.5 Relationship between IP and international trade

Issues

What is the relationship between the IP protection system and the balance of trade in IP? What are the most important sectors of the economy affected by the IP system? How could the IP protection system better serve Australia's strategic interests?

Discussion

Much of the following section draws heavily on the recent Department of Foreign Affairs briefing paper on the current TRIPS review.⁴⁹

⁴⁵ Ulrich Schatz, European Patent Office, *European Patent Costs*, and Michael Meller & Eli McKhool, *Statutory and Procedural Changes which would reduce patenting costs in Canada*, papers delivered at the Third International Symposium on Reducing Patent Costs, 30 June 1998.

⁴⁶ BIE, 1994, pp 30-31.

⁴⁷ Cohen et al., Appropriability Conditions and Why Firms Patent and Why they do not in the American Manufacturing Sector, 1996, reported in OECD, 1997, p.29

⁴⁸ OECD, 1997, p.30

⁴⁹ "Intellectual Property: A Vital Asset for Australia", A background briefing paper on the Review of the TRIPS Agreement, November 1999.

The International environment for IP Protection

The Uruguay Round multilateral trade negotiations recognised the growing importance of IP as a component of international trade, and that inconsistencies in IP protection between jurisdictions could impede trade and investment. The conclusion of the TRIPS Agreement, as part of the World Trade Organisation's system of trade rules, was undertaken specifically in recognition of this.

Even though Australia's IP system was largely in conformity with the TRIPS standards, from our perspective, TRIPS is a highly desirable development because of the effect it has and will continue to have on removing IP-related impediments to Australia's international trade and investment. The principal features of the TRIPS Agreement are designed to address the following impediments to exploiting IP in foreign markets:

- Varying and often minimal standards in IP protection in foreign jurisdictions – TRIPS provides for minimum standards for IP protection in the national systems of WTO members (e.g. copyright protection for computer software);
- Varying and often minimal standards of IP administration and enforcement – TRIPS provides consistent standards for IP administration and enforcement;
- Lack of transparency in national IP laws and systems – TRIPS requires members to provide details of their national IP laws and systems, and to answer questions about their IP systems;
- Lack of a dispute resolution mechanism for IP trade issues – TRIPS provides a predictable rules-based system regarding the settlement of disputes about IP issues;
- Lack of support for other complementary objectives such as repressing unfair competition, facilitating technology transfer and promoting public health and environmental protection – TRIPS addresses this deficiency.

All industrialised countries have been bound by TRIPS since 1996 and other developing countries and economies in transition that comprise the 134 members of the WTO are due to give effect to TRIPS standards by January 2000. This means that virtually all Australia's major trading partners will be covered by the TRIPS Agreement.

Australia has an excess of imports over exports in all IP items, including patents, copyrights, designs and trademarks. OECD figures for 1997 indicate that, while Australia's technology balance of payments is in deficit, Australia ranks ahead of, for example, France, Britain and Germany, which have more significant deficits as a percentage of GDP.⁵⁰ A country's technology balance of payments is the difference between its exports of technology (such as international licensing contracts and technical assistance) and its imports (such as purchases of foreign patents, know-how and R&D).

While Australia's trade deficit relates to our traditional exports of commodity items and imports of elaborately transformed manufactured goods, exports of knowledge-intensive Australian products and services to jurisdictions whose IP systems are less predictable and responsive than our own have been limited.

⁵⁰ The Economist, 21 August 1999, p 89.

The TRIPS Agreement will enable Australia to continue to increase its level of exports of R&D intensive products (pharmaceuticals, computers, telecommunications equipment, industrial machinery and scientific instruments), trade marked products (wine and processed food) and royalties from copyrighted service exports (computer software and services, and film production). This is particularly vital to Australia as it attempts to alter its export profile in response to the increasing demand for knowledge-intensive products and services. The IP content of imports will continue to rise as well because of the global rise in elaborately transformed manufactured goods and professional services trade.

Australia's objectives in TRIPS and related IP negotiations have therefore been threefold:

- To ensure that our own intellectual property system adheres to international standards established by TRIPS whilst domestically maintaining an appropriate balance between the rights that reward innovation and risk-taking, the public need for access to new technology, transparency and a fair and open market;
- To ensure that standards required under TRIPS will create stability and transparency in the IPR systems of our major trading partners;
- To ensure that our major trading partners are given appropriate encouragement and assistance to adhere to TRIPS standards.

The impact of the IP system on Australia's economy and trade

The Productivity Commission⁵¹ has undertaken extensive analysis of the IP content of Australia's production and trade and the extent to which IP-related costs are recovered through IP protection, thereby indicating the importance of IP protection to GDP and trade. This is done using the Maskus (1993) Indices, the estimates of Gruen, Bruce and Prior (1996), and using its own methodology to measure patent content of production and trade (the portion of BERD costs recovered through patent protection).

These analyses conclude that Australia is more reliant on imported BERD than domestic BERD and that we export considerably less BERD than we import. However, measured over the last two decades, this gap is narrowing considerably. This is related to the sharp rise in patent-related BERD expenditure, which climbed from 0.2% of GDP in 1976/7 to 0.6% in 1996/7.

The Productivity Commission also examined the estimated value added of copyright protected industries, although there is less extensive data to support conclusions regarding the economic importance of copyright protection. This analysis revealed that copyright is in fact more significant to Australia than patent protection in domestic production. However, the Commission noted that this conclusion was based on cost of production rather than economic benefits and does not account for the possibility of considerable positive spillovers associated from patents as opposed to those arising from copyright material.

One explanation of this finding is that international trade helps to defray the cost of R&D (and patent content) over a large volume of sales, thereby lowering the unit cost of new technologies. In the case of copyright material, international trade is less important in

⁵¹ This section is largely based on the analysis contained in the Productivity Commission, "Trade Related Aspects of Intellectual Property Rights", Staff Research Paper, May 1999, Chapter 4, pp 56-81.

defraying the “cost of creation”. A large proportion of copyright content is domestically sourced whereas most patent content is imported. These findings highlight the point that through international cost defrayment, Australia gains much by relying on imported technologies, patent protected or otherwise. This is an important point in relation to Australia’s optimal IP policy standpoint.

Some commentators believe that patenting in all jurisdictions is the minor player in the link between innovation and trading in IP, and that Australia’s domestic economy is strongly driven by the creation and trading in products that are “new” not because of their patentable inventive step but because of their unique position in the marketplace through branding and marketing – business know-how protected through trade marks, trade secrets and copyright. The case studies at the end of the paper illustrate the importance of manufacturing know-how and brand recognition in successfully taking technology into competitive markets.

A discussion on the relationship between IP protection and trade and Australia’s optimal policy stance in this area must be seen both in the context of globalisation and the TRIPS agreement introduced by the World Trade Organisation in 1995.

Whilst the TRIPS agreement has developed from numerous earlier IP agreements, it contains a number of significant additional features that have the effect of introducing greater consistency in IP rights around the world (e.g. the extension of patent terms to 20 years) and of compelling signatories to enforce IP rights. Australian IP laws are compatible with the minimum standards required by TRIPS. Most developed countries, Australia included, had at the time and have now higher standards than the minimum standards mandated by TRIPS. The major change required in Australian law was to lengthen the term of patents from 16 to 20 years.

Aside from the accepted need of the IP protection system to prevent “free-riding”, to encourage investment in IP, and to protect the “moral” right of individuals and firms to the results of their intellectual effort, the question remains as to what broader economic benefits arises from IP. Is maintaining a strong IP protection system that is consistent with TRIPS in Australia’s best economic interests, bearing in mind our status as a net importer of technology?

In its paper, *The Economics of Patents*, the BIE distinguishes between the technological progress of advanced economies, which results largely from the introduction of new technology, and developing economies, which tend to import and adapt existing technology. In other words, their progress is driven by the delayed capture of spillovers of technologies developed elsewhere. As a nation changing from a commodity-based economy to a technology-based economy, Australia is a net technology importer, substantially benefiting from technologies developed in other countries.⁵²

In relation to IP that is protected by patent or other IP mechanisms, it is tempting to think that Australia should alter its legislation to better suit local interests, given that the vast majority of patents are granted to non-residents and that these patents allow non-residents to charge for use of the technology in Australia. However, this is not considered desirable because if, for example, we unilaterally lowered our inventive height to suit local interests, our exported

⁵² BIE, 1994, p 19.

innovations would be unprotected overseas whilst foreign innovations imported to Australia might still benefit from monopoly prices. A stronger IP stance would only be justified if the predominant threat of imitation were to come from other local inventors, which is an unlikely scenario.⁵³

Both the BIE and the Productivity Commission have argued that a unilateral weakening of Australia's patent system would be counter-productive because of probable retaliations, loss of the benefits to be gained from imported technology and the likelihood that it would have little overall impact on prices for products controlled by global oligopolies and monopolies.⁵⁴

Even if there was no retaliation from other countries, a hypothetical situation where every country structured its IP legislation purely to suit its own best interests would be less optimal overall than cooperative measures such as TRIPS.⁵⁵

From Australia's perspective, the optimal approach appears to be compliance with at least the minimum standards required under TRIPS. This avoids any retaliation or disciplinary action on the one hand, whilst minimising interference with domestic competition and the likelihood of additional advantage to foreign IPR holders.⁵⁶

This holds true even in areas such as bioengineering where Australia is a net exporter of innovations. Currently, Australia has higher domestic IP protection standards concerning the treatment of new life forms above the micro-organism level, corresponding to US standards.

Australia should continue to maintain a standard comparable with other significant developed countries such as the US, Japan and Europe, which also maintain a higher standard than the minimum required under TRIPS.

Concern was expressed in the 1993 Report of the Chief Scientist that Australian exporters often faced problems because of variable levels of protection and difficulties of enforcing IP rights with some trading partners in the region.⁵⁷ While TRIPS has addressed this, the full effects of TRIPS will not be apparent until the expanded and improved scope of IP protection has been set in place in our trading partners in the region.⁵⁸

Section 4.1 below further addresses the issue of strategic use of the IP system to advance Australia's strategic interests. This appears to be more a matter of effective IP management. The trend of discussion in the current section is that it is not feasible for Australia to cause its IP system to depart from international standards for perceived strategic benefits to Australia.

⁵³ Productivity Commission, 1999, p.32

⁵⁴ BIE, 1994, pp 47-9.

⁵⁵ Productivity Commission, "Trade Related Aspects of Intellectual Property Rights", Staff Research Paper, May 1999, p.28.

⁵⁶ Productivity Commission, 1999, p.xvi

⁵⁷ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 25-29.

⁵⁸ Department of Foreign Affairs & Trade, "Intellectual Property – A vital asset for Australia – a background briefing paper on the review of the TRIPS Agreement", November 1999, p 5.

Some commentators believe that Australian business could make more effective use of IP in business strategies. For example, the case studies show that IP protection is not simply a matter of protecting a discovery, but strategically positioning the resulting product in the market to develop brand recognition and be able to respond to potential competition. That is how our competitors in the global marketplace operate.

Possible initiatives

- Ensure that Australia's IP system is continually kept up to date with international developments to ensure competitive neutrality with the systems of leading technology nations.
- Encourage all trading partners to implement the minimum requirements of the WTO TRIPS Agreement and support countries in Australia's region to develop their IP systems.

1.6 Impediments in the IP protection system to innovation?

Issues

Are there weakness in the system for obtaining IP protection? Are there aspects of the IP protection system which inhibit innovation in Australian business? The key issue is to test the IP system from the point of view of researchers and generators of IP, and also to take into account the perspective of commercial enterprises who invest in commercialising innovation. Should there be a greater number of options for protecting IP to allow greater flexibility? Can the acquisition and enforcement of IP rights be made more affordable?

Discussion

While unpatented know-how is protected by the general law relating to confidentiality and trade secrets, this protection does not extend to excluding creation by others, and secrecy prevents achieving the full potential for spillover benefits. Similarly, copyright protection provides less effective protection against imitations than patents.

Accordingly, there may be a case for providing patent-like protection in areas such as confidential information and the information industries which rely on copyright protection.⁵⁹ However, as noted above in the discussion of TRIPS, a unilateral initiative would be unlikely to be effective.

1.7 Do IP valuation issues adversely impact on innovation?

Issues

Are there practical models for the valuation of IP? Do valuation problems and accounting standards prevent IP being adequately recognised as part of enterprises' intellectual capital?

⁵⁹ BIE, 1994, pp 46-47.

Discussion

The task of valuation is to assess the fair market value of the asset to the owner or a prospective purchaser under assumed normal market conditions. Essentially, valuation methodology is based upon discounting estimated future cash flows using a rate of return appropriate to the investment risk to derive a net present value. Values can be affected by changes in market conditions affecting the asset or products produced using the asset, interest rates, inflation, taxation and the availability of substitute assets which compete for investment funds. These factors usually manifest themselves in prices at which assets are sold in the market.

A study by Arthur Andersen in 1992 in the UK found that, despite there being well understood methodologies capable of supporting reliable valuations of intangible assets for financial reporting purposes, there was a lack of confidence due to perceived subjectivity involved in the assessment by the valuer of the technical and commercial variables.⁶⁰ This is particularly so where there is an absence of an active market with comparable transactions to indicate market value, as is generally the case with internally generated assets.⁶¹

The practical application of valuation principles to particular technologies can require as much attention be given to the technical and commercial assessment of the technology as to the valuation model. Further, the existence of IP rights may be important but not essential to creating value, which will also be significantly influenced by commercial factors such as market conditions and the ability of management to promote and commercialise the technology. The skill and experience of the valuer is a critical factor affecting the reliance that can be placed on the valuation.

The Arthur Andersen study concluded that codification of methodologies and promulgation of professional practice standards might assist in increasing acceptance of technology valuations within the business community, however, there will always be situations where technology cannot be valued with sufficient confidence to merit inclusion in financial statements.

Companies wishing to value their technology on balance sheet face a number of dilemmas:

- (a) conservative accounting policies and standards prefer under-statement of asset values rather than expose the entity to losses if values cannot be recovered;
- (b) consistency requires that all assets of the same class should be valued at the same time, rather than selecting particular assets for revaluation;

⁶⁰ Arthur Andersen, "The Valuation of Intangible Assets", Special Report No P254, London, January 1992.

⁶¹ Urgent Issues Group Abstract 7 "Non-current assets – Derecognition of Intangible Assets and Change in the Basis of Measurement of a Class of Assets", March 1996, para 11. International Accounting Standard IAS 38 "Intangible Assets", issued September 1998 (http://www.iasc.org.uk/frame/cen2_138.htm). Group of 100 Submission to AASB on IAS 38 ("http://www.group100.com.au/submissions/sub_ias38_19981110.htm"). Inland Revenue, "Reform of the Taxation of Intellectual Property", March 1999 ("<http://www.inlandrevenue.gov.uk>"), Ch 5 dealing with accounting issues.

- (c) directors have duties in relation to statutory financial accounts to ensure that asset values are not over-stated;
- (d) capitalisation of development costs may be inimical to obtaining tax deductions under general provisions of the tax law;
- (e) the value of assets having limited useful lives is required to be amortised over the relevant period, which will adversely impact on future profits.

For example, Monsanto Company at 30 June 1997 had US\$1 billion invested in patents and other intangible assets (which it estimates for accounting purposes must be written off over the following 10 years).⁶² By contrast, Biota Holdings Ltd (see case study under section 7 below) does not carry any intangible assets on its balance sheet, and all R&D expenditure is charged to expense as incurred.⁶³

The EU has begun a major study which aims to improve policy-making capabilities in the realm of science and technology policy, and particularly innovation policy, by providing a consistent basis for the reliable measurement of intangible investments in "intellectual capital", a concept for more broad than mere IP.⁶⁴ In part this is a response to the increasingly widening gap between the market capitalisation of enterprises and their net assets disclosed in financial statements.

Accounting policies which recognise the costs of innovation up front while deferring the benefits to subsequent periods, and which discriminate against recognition of internally generated intangible assets, may adversely impact on innovation, especially when finance markets place greater value on immediate earnings performance.⁶⁵

However, financial reporting issues do not impact directly on the appropriate use of valuations for IP management purposes and are beyond the scope of this paper.

Valuations may be required for a variety of purposes other than financial reporting, such as to satisfy taxation requirements for certain types of transactions, for example, if licence fees are to be written off over the life of the licence under the now discontinued R&D syndication or other continuing tax provisions.

⁶² Monsanto Company, 1997 Annual Report (sourced from the company's internet site: "<http://www.monsanto.com>").

⁶³ Biota Holdings Ltd, 1998 Annual Report.

⁶⁴ See generally the OECD International Symposium on "Measuring and Reporting Intellectual Capital: Experience, Issues and Prospects", 9-11 June 1999, Amsterdam, Conference Papers (<http://www.oecd.org/dsti/sti/industry/indcomp/act/Ams-conf/symposium.htm>), particularly Professor Leandro Canibano et al "Measuring Intangibles to Understand and Improve Innovation Management – Preliminary Results".

⁶⁵ Professor Baruch Lev, "The Inadequate Public Information on Intellectual Capital and its Consequences", pp 5-6 and 10, OECD International Symposium (<http://www.oecd.org/dsti/sti/industry/indcomp/act/Ams-conf/symposium.htm>).

Valuation of IP is a key commercial issue in raising funds for R&D and commercialisation of IP, for example, to facilitate negotiation of joint ventures and licensing arrangements.⁶⁶ Most commercial decisions which need to be made in effectively managing IP require the manager to have a sound understanding of the value of the IP. It is often useful for effective IP management, and to give the valuation objectivity and credibility with third parties, that the valuer be independent of the researcher and technology management.

Independent valuation has a cost, which must be managed just as the cost of IP protection has to be effectively managed.

The 1993 report of the Science & Engineering Council recommended that grants to public research institutions should require assessment of the value of IP generated, to raise awareness of these issues, but noted the downside that unrealistically high expectations of value could be an impediment to subsequent technology transfer and commercialisation.⁶⁷

The case study of Recaldent™ at the end of this paper suggests that early independent valuation would provide a check on the expectations of researchers and management to address this problem. The ResMed case study indicates that the early identification of the commercial "path to market" is a crucial issue, as is the need for speed in getting new technology to market. Early independent valuation might assist in these areas, particularly in the case of technology developed by public research institutions.

The paper by Ferrier and McKenzie at the recent OECD symposium proposed that an information and self-evaluation kit be developed for enterprises to encourage experimentation in measuring and reporting intellectual capital.⁶⁸

The recent Biotechnology Australia discussion paper asserts that, because of the difficulties of valuation, organisations find it difficult to recognise when IP has value and to take the necessary steps to protect and commercialise it.⁶⁹

Possible initiatives

- Codification of valuation methodologies and promulgation of professional practice standards, endorsed by the ATO where relevant to continuing taxation provisions and by ASIC where relevant to statutory financial disclosures.
- Consideration by ASIC of requiring disclosure of technology valuations by way of note to the accounts, rather than taking valuations on balance sheet giving rise to amortisation issues, to encourage companies to provide such information.

⁶⁶ Biotechnology Australia, Draft Discussion Paper, p 14.

⁶⁷ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 10-11.

⁶⁸ Fran Ferrier and Phillip McKenzie, Monash University-CEET "Looking Ahead: An enterprise information and self-evaluation kit", OECD International Symposium (<http://www.oecd.org/dsti/sti/industry/indcomp/act/Ams-conf/symposium.htm>).

⁶⁹ Biotechnology Australia, Draft Discussion Paper, p 9.

- Consideration whether best practice in IP management requires valuation of IP prior to patent application and periodically afterwards.

1.8 What are the causes of investment blockages?

Issues

Do the procedures for protecting IP impede capture or commercialisation of IP? Is there scope for more effectively promoting the output of publicly-funded R&D? How do different kinds of IP rights affect the availability of funding and ease of collaboration? What is the relationship between taxation incentives and taxes on management of various kinds of IP?

Discussion

It is apparent from the nature of R&D that there are a number of difficulties in getting a tax deduction for R&D expenditure under the general deduction provisions of the tax law:⁷⁰

- expenditure on research, even if it has a specific practical application, would not satisfy the test of being incurred in gaining or producing assessable income;
- new companies established for R&D purposes would not satisfy the test of being necessarily incurred in carrying on an existing business;
- it seems that R&D expenditure by established commercial organisations which seek to extend their business into new products or processes would not qualify unless continuous R&D activity is an established part of their business;
- if the outcome is new technical knowledge or new or improved products or processes that add to the profit-making structure of the organisation, the expenditure would appear to be of a capital nature and non-deductible;
- spin-off companies may be detrimentally affected by not being able to "group" tax losses with their parent company when they become less than 100% owned.

In 1956 it was recognised that certain IP rights which are not of an enduring nature ought to be treated analogously with depreciable assets. Division 10B (now Division 373) was introduced to allow taxpayers to write off the capital costs of developing or purchasing certain IP rights, over the period of the right, for the purpose of producing assessable income. The rights concerned were a patent, registered design or copyright or a licence to use a patent, registered design or copyright.

At the same time, Section 68A was introduced to allow a deduction for the costs of obtaining the grant or renewal of a patent, registered design or copyright for the purpose of producing assessable income.

⁷⁰ *Goodman Fielder Wattie Ltd v. FCT* 91 ATC 4438.

Division 373 will not apply where the technology is in the research and development stage. Further, there are significant IP rights to which Division 373 does not apply, such as trade marks and trade secrets. While these rights have indefinite lives, nothing endures forever, particularly in the overlap between the fields of technology and commerce.

The 125% deduction for eligible R&D expenditure incurred by Australian companies registered with the Industry Research and Development (IR&D) Board was introduced under Section 73B of the Income Tax Assessment Act with effect from 1 July 1985 (originally at 150%). Complementary legislation provided for grants for R&D for companies that could not derive benefits from the income tax concession.

However, since 1996, expenditure on the acquisition of core technology or a right to use core technology in connection with R&D activities is deductible by writing off effectively over the period of the R&D activities, up to a limit of one third of the related "research and development expenditure" under Section 73B rather than Division 373.

There was also a major tension in the tax provisions prior to 1996 in that, despite policy objectives of unlocking IP in public research institutions and encouraging them to undertake commercial funding of R&D, there was a perception that licence fees paid by commercial enterprises to public research institutions involved abuses of the tax exempt status of public research institutions.

Tax concessions can facilitate policy objectives of encouraging investment in technological innovation by overcoming the barriers to R&D which exist under a taxation system. A tax concession can be socially justified to capture spillover benefits up to the point at which the cost of the concession in terms of revenue foregone equals the resulting increase in spillover benefits.⁷¹ The assessment of tax foregone depends on your view as to the true extent of the concession (for example, whether basic deductibility ought to occur anyway).

Discussion of those issues is beyond the scope of this paper, however, the management of IP is affected where there is potential for uneven treatment under the tax law of very similar expenditure by different taxpayers according to the nature of their business, and the nature and outcome of their research and the IP rights acquired.⁷²

There are also a number of commercial barriers arising from the nature of different IP rights which might possibly be addressed by reform of IP laws to encourage R&D and innovation.⁷³ For example:

71 Bureau of Industry Economics, "R&D, Innovation and Competitiveness", Research Report 50, (AGPS, August 1993), pp. 170-176.

72 Review of Business Taxation, Final Report, *A Tax System Redesigned*, p 330. Mortimer, pp 104-110. HM Treasury, Department of Trade and Industry, "Innovating for the Future: investing in R&D, a consultative document", March 1998 (sourced from HM Treasury's Internet site: "<http://www.hm-treasury.gov.uk/pub/html/budget98/chxstat2.htm>"), paras 4.03-4.05. Inland Revenue, "Reform of the Taxation of Intellectual Property", March 1999 ("<http://www.inlandrevenue.gov.uk>").

73 HM Treasury, Department of Trade and Industry, "Innovating for the Future: investing in R&D, a consultative document", March 1998 (sourced from HM Treasury's Internet site: "<http://www.hm-treasury.gov.uk/pub/html/budget98/chxstat2.htm>"), para 1.19.

- (i) the current protection of know-how by the law of confidentiality and trade secrets limits the diffusion of innovation – and creates a tension within the academic culture of universities which encourages the free circulation of ideas;
- (ii) formal IP protection may be the best commercial strategy where R&D investment is long and costly, but in some cases may not be cost-effective or an appropriate commercial strategy;
- (iii) start-up companies may lack funds to meet the costs of IP protection or to enforce or defend IP rights.

A factor contributing to difficulties of public research institutions in raising commercial funding has been identified by a report of the Chief Scientist as the "innovation protection gap".⁷⁴ The research culture encourages publication and consequently patent applications must be filed earlier than for commercial enterprises where secrecy can be maintained until commercial efficacy has been established. This brings forward the incurring of patent expenses, and the need to secure commercial funding, to a time when it is difficult to secure commercial investment because of the high risk. This is further discussed in section 2.2 below.

It is widely accepted that Australia does not perform as well as many of its international competitors in the commercialisation of its IP. While Commonwealth and State Governments have invested well in public sector research, some commentators believe we have failed to capitalise on this investment.

The reasons suggested for this sub-optimal performance are numerous and varied. Many relate to systemic failures which block the functioning of the innovation system, hinder the flow of knowledge and technology and consequently, reduce the overall efficiency of national R&D efforts. These failures are often the result of mismatches and gaps between different components of the innovation system.

Whilst many of these deficiencies are outside the scope of this paper, it is clear that some barriers to commercialisation relate to IP management in companies and research institutions. Whilst in some instances, the IP system itself may be an impediment, management practices are also frequently a problem:

- under-developed skills for high-tech business, product and service development, marketing and delivery;
- rigid institutional structures and cultures which inhibit interaction between the research base and industry and market-based activities;
- an investment environment geared towards commodities, stocks and traditional industries which is incapable of assessing knowledge-intensive commercialisation risk and is further constrained by an uncompetitive taxation system.

⁷⁴ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 20-21.

Commonwealth and State Governments have recognised the need for action in these areas and have, in recent years developed a range of programs that address these barriers to innovation, including:

- R&D START;
- Commercialising Emerging Technologies (COMET);
- Innovation Investment Fund (IIF);
- Pooled Development Funds (PDF);
- Technology Commercialisation Program (Victorian program).

These programs each focus on improving the commercialisation of IP within the context of addressing broader impediments to innovation. COMET was launched by the Minister for Industry Science and Resources on 17 November 1999 to provide assistance with commercialisation planning and management skills development.⁷⁵

In addition, the increasing efforts being made by research institutions and private bodies, with and without specific government funding, to create more high technology businesses through various incubation facilities and services should also be acknowledged.

Possible initiatives

- Review legislative amendments to the tax provisions for writing off capital costs to ensure neutral treatment across different kinds of IP rights.
- Review the tax provisions for deduction of R&D expenses and for writing off capital costs to ensure neutral treatment of tax loss companies and public research institutions to facilitate unlocking their IP.

2. MANAGEMENT OF IP IN PUBLIC RESEARCH INSTITUTIONS

2.1 Ownership of IP

Issues

The process of unlocking potential by improving the management of IP is a key issue. Who owns or should own university IP? How does this impact on research funding and commercialisation? Are university researchers adequately recognised and rewarded for innovation?

Discussion

⁷⁵ Senator Minchin, Speech, 17 November 1999 ("<http://www.isr.gov.au/speeches/1999/comet.doc>").

There has been considerable discussion of the legal and policy issues in this area. The following discussion draws heavily on the Australian Vice-Chancellors' Committee ("AVCC") paper *Ownership of IP in Universities*.⁷⁶

The focus of the present paper is the management of IP and, although the discussion in this section deals with IP ownership, and the AVCC paper deals with policy issues regarding IP ownership, it should not be forgotten that ownership is about securing control over management as much as securing ultimate disposition of financial rewards.⁷⁷ It would be a mistake to conclude that solving the question of ownership automatically solves the problem of management.

It is in general true to say that, where an employee in the course of their employment creates IP, the ownership of that IP reverts to the employer. This applies by operation of legislation in the case of certain IP such as copyright and designs, but in the case of patents it depends on the terms of employment or common law principles that can have much the same effect. It follows that there will be situations where the legal rules result in the institution owning the IP, however, there will be many situations where the impact of the legislation or the common law is unclear or turns upon the particular facts and circumstances.⁷⁸ The most important of these circumstances are discussed in the AVCC paper, such as identifying the duties of the staff member to determine "course of employment", the extent of institutional funding and other resources that contribute to the IP, use of background IP of the institution and contribution of other staff members working as part of a team.

In developing an IP policy, an institution needs to clarify those situations where the institution is more clearly the owner of IP rights and those where it is desirable for greater certainty for binding agreements to be made with staff to vest ownership in the institution.⁷⁹

The AVCC paper discusses policy objectives which will influence the development of an IP policy, including:⁸⁰

- Promoting the institution's education and research objective.
- Promoting the welfare and success of the institution through its contribution to the community and industry and commerce.
- Providing funding for research through ventures with industry and commerce.
- Providing reasonable remuneration for staff and rewards for sound performance, so as to attract and retain highest quality staff.

⁷⁶ Australian Vice-Chancellors' Committee, "Ownership of intellectual property in universities: a discussion paper", Canberra, 1995.

⁷⁷ AVCC, p 31.

⁷⁸ AVCC, pp 8-11.

⁷⁹ AVCC, p 9.

⁸⁰ AVCC, pp 7-8.

- Obtaining an appropriate return for the use of resources invested by the institution.

The AVCC paper contains an excellent detailed discussion of legal and policy issues, however, the unstated objective which is implicit in the above is that the IP policy should facilitate a culture of innovation – the first objective in relation to IP must be to create it.⁸¹

Some commentators suggest that public research institutions have been unable to provide competitive remuneration and provide appropriate incentives to reward performance.⁸²

A further objective implicit in the above is that the institution should not be directly involved in commercialisation of IP but would transfer the technology to a commercial party with the necessary capital, experience and commercial know-how.⁸³

As the AVCC paper observes, there will be any number of ways an institution might pursue the above objectives, and the particular IP policy an institution adopts will be determined by its own objectives and priorities.⁸⁴

It appears common for institutions to allow copyright in publications to be held or enjoyed by the staff member, reserving rights for the institution to use it for education and research.⁸⁵

There appear to be at least two models which could be adopted regarding ownership of other technology (including computer programs which are protected by copyright):

- A. The institution owns the IP and shares the rewards with staff. The IP statute would divide rewards from commercialisation between the institution, the department and the staff. The AVCC suggests that this model may be best where IP arises from team activities, particularly involving computer programs, where it can be difficult to identify separate work the subject of IP rights.⁸⁶ Mechanisms are required to handle disputes between staff as to the division of the staff component – the AVCC recommends the procedures should be "independent, fair and credible".⁸⁷
- B. The institution assigns IP to staff upon submission of a valid claim, reserving to the institution a share of the rewards. This model is being implemented by the

⁸¹ Office of the Vice-Chancellor, the University of Melbourne, "Managing IP: discussion paper", 1999, p 4. AVCC, p 37 (University of Newcastle IP Policy).

⁸² Biotechnology Australia, "Commercialisation of Biotechnology in Australia", Draft Discussion Paper, October 1999, p 13.

⁸³ AVCC, p 75 (University of Cambridge IP policy). Office of the Vice-Chancellor, the University of Melbourne, "Managing IP: discussion paper", 1999, p 8. AVCC, p 37 (University of Newcastle IP Policy).

⁸⁴ AVCC, pp 1 and 31.

⁸⁵ AVCC, p 75 (University of Cambridge IP policy), p 47 (Monash University IP Statute). Office of the Vice-Chancellor, the University of Melbourne, "Managing IP: discussion paper", 1999, p 6.

⁸⁶ AVCC, p 16.

⁸⁷ AVCC, p 32.

University of Melbourne.⁸⁸ Under this model the staff member becomes exposed to the risks as well as the benefits of ownership, including taxation exposure on assignment of the interest and upon capital gains being realised, and business risks such as insolvency and liability in connection with commercialisation. With these risks comes the benefit of being in control of managing the IP. Tensions will be created if future IP may be generated by a team of researchers collaborating with the original inventor. For the institution, the ability to raise commercial research funding will be affected if the researcher holding commercial rights leaves.

The distinction between these models is blurred, because both contain opt-out provisions. So under model A, the institution may decline to pursue its rights and assign them to the staff member.⁸⁹ A short period is allowed under this model for the institution to evaluate the technology and decide on its involvement. Under model B, the institution reserves the right to take back commercialisation rights if it feels the staff member is not taking reasonable steps to protect and exploit the IP.⁹⁰ It appears that in reality the application of an IP policy depends on management decisions to be made on a case by case basis – for example, the Stanford IP policy, which is in form model A, acknowledges and provides for this.⁹¹

The next section discusses the issue of management of IP, which is the same under both models.

Possible initiatives

- Public research institutions should share the risks and rewards of commercialisation of IP with researchers by appropriate commercial arrangements on a case by case basis according to the technology and their circumstances.
- Researchers need to be made aware of their rights under IP policies and most importantly their options for negotiating variations on a case by case basis appropriate to the technology and their circumstances.
- Institutions themselves may have a conflict of interest in providing information and advice to researchers on these matters, so there may be merit in state or federal government programs to provide this assistance.

2.2 Management practices

Issues

How should the IP best be managed? How does this impact on research funding and commercialisation? How do management practices reconcile the interests of the

⁸⁸ Office of the Vice-Chancellor, the University of Melbourne, "Managing IP: discussion paper", 1999.

⁸⁹ AVCC, p 39 (University of Newcastle IP Policy), p 53 (Monash University IP Regulations).

⁹⁰ University of Melbourne Draft IP Statute, September 1999.

⁹¹ Stanford University, "Inventions, Patents and Licensing", Research Policy Handbook, Document 5.1, paras 4 and 5 (sourced from the university's internet site: "<http://www.stanford.edu/dept/DoR/Resources/ip.htm>").

researchers, the institution and commercial collaborators? Are there adequate IP management skills in university exploitation enterprises, Cooperative Research Centres, etc? Are there better models for academia-industry linkages?

Discussion

Researchers need access to effective management skills and funds to get across the "innovation protection gap" mentioned in section 1.8.⁹² The research culture encourages early publication, which brings forward the incurring of patent expenses, and the need to secure commercial funding, to a time when it is difficult to secure commercial investment because of the high risk. This also seems to be the experience in the US.⁹³ A consequence of this is that further research is required involving the inventor to successfully develop and commercialise the technology.⁹⁴

Some commentators suggest that pressures on researchers to publish early to protect funding and status should be minimised or eliminated.⁹⁵

Patents legislation in the United States provide a "grace period" to the effect that early publication is not fatal to patentability provided the application is lodged within a specified period. There are similar provisions in Canada, and more limited provisions in Japan and Europe.

This provides some protection for researchers against inadvertent publication, however, it should not be regarded as a substitute for effective management of publication decisions, because priority can still be lost and commercial disadvantages of early publication still apply.

Some commentators suggest that the grace period works in the US because of their unique (in a worldwide sense) "first to invent" rule which applies for priority purposes rather than the "first to file" rule. Therefore no one can take ideas that have been published and try to patent them. A grace period in Australia might expose those who publish to the risk of losing patentability in other jurisdictions that don't acknowledge grace periods without the additional protection of being able to argue that they were the first to invent (as they would in the US). This is an issue which would have to be considered. The 1984 IPAC report recommended that a "grace period" would have to be implemented globally, as a unilateral approach by Australia could lead to loss of rights overseas for Australian inventors.⁹⁶

It seems to be acknowledged that the major problem facing researchers in public research institutions is finding the required funding to maintain patent coverage until commercial

⁹² Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 20-21.

⁹³ Richard Jensen and Marie Thursby, "Proofs and Prototypes for Sale: the Tale of University Licensing", National Bureau of Economic Research, Cambridge, MA, August 1998 ("<http://www.nber.org/papers/w6698>"), p 1.

⁹⁴ Jensen and Thursby, pp 1-2.

⁹⁵ Biotechnology Australia, "Commercialisation of Biotechnology in Australia", Draft Discussion Paper, October 1999, p 18.

⁹⁶ Industrial Property Advisory Committee, "Patents, Innovation and Competition in Australia", August 1984, p 51.

investment can be found.⁹⁷ One approach to this problem is for public research institutions to adopt an IP policy under which ownership vests in the researcher, who is then responsible for covering patent costs.

Under any model of IP ownership, innovative technology needs early assessment for availability and desirable form of IP protection and potential commercial viability. Overseas practice appears to favour this being undertaken by a technology arm of the institution – see the examples in section 2.3 below.

Australian universities have similar bodies. It may be questioned whether Australia is a large enough market place, and whether there is a sufficient pool of the necessary management skills, to support a technology management company for each institution. Perhaps issues of conflict of interest would make it difficult for one such company to provide IP management services to a range of institutions, each of which may be competing for commercial funding in the same field.

Some commentators believe that the apparent shortage of expertise is simply a result of the inability of institutions to pay commercial salaries for technology managers having both the commercial and technical expertise in managing the technology available for commercialisation.

The Wills Report on medical research considered that critical mass was required to add effective management skills to the research institution.⁹⁸

The critical mass factor suggests that service providers need to become larger, possibly through mergers or alliances between such bodies associated with public research institutions. On the other hand, if institutions cease to provide such services in-house, it might lead to a proliferation of service providers. While a competitive environment is likely to enhance specialisation and the standard of services, overseas experience suggests a trend towards service providers taking equity in return for assistance with start-up companies, and the challenge for researchers is to choose the right ally.⁹⁹

Australian surveys indicate that about 21% of respondent biotechnology companies have at some time abandoned projects because further work was blocked by IP rights held by another organisation – leading commentators to speculate there was inadequate due diligence at the outset of the project.¹⁰⁰ However, in fast-moving areas of technology this is a fact of life, and conflicting IP rights raise issues that have to be effectively managed, for example through strategic collaborations.

Some commentators assert that the absence of strong entrepreneurial skills in biotechnology management, a shortage of commercial management skills and experience amongst

⁹⁷ Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p 33.

⁹⁸ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, p 3.

⁹⁹ David Crowe, "Silicon Valley Observed", Australian Financial Review, 8 December 1999, p 12.

¹⁰⁰ Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p 35.

researchers, and the absence of reward structures in public sector research institutions which encourage commercialisation, make it difficult for Australian biotechnology to match the commercialisation achievements of most of our overseas competitors.¹⁰¹ The recent green paper on higher education research advocated accelerating the movement in public research institutions to revise reward structures and IP frameworks to encourage researchers to pursue commercial development of their work.¹⁰²

It seems that the institution and the researcher have common interests in ongoing effective management of IP (apart from the financial interest in sharing the rewards of commercialisation):

- Many innovations arise out of the institution's background IP, which will require participation by the institution in further research and commercialisation of the innovation itself.¹⁰³
- Where a number of researchers are co-inventors, there will be ongoing management issues concerning the use of the technology in the best interests of all concerned.¹⁰⁴
- The technology will form part of ongoing research activities of the researcher and the institution which must be funded and coordinated with other research activities in the department and the institution.

Despite these common interests, the study by Jensen and Thursby in the US indicated that university technology management companies perceive the interests of the university and the researchers to be different – the researcher and the department see IP protection and licensing as a means to raise research funding, whereas technology managers and university administrators perceive license revenue to be more important.¹⁰⁵

Some commentators believe that a greater proportion of research funding should be allocated to commercialisation activities than at present, noting a 1999 study of Cooperative Research Centres that found on average only 4.24% of total resources were allocated to commercialisation compared to 81.5% to R&D.¹⁰⁶ This raises the question of how scarce resources should be allocated and where funds will come from to cover commercialisation activities as well as the actual research – a key management issue.

A number of recent Government reports are advocating imposing more direct obligations on both publicly funded researchers and research organisations to better commercialise their

¹⁰¹ Biotechnology Australia, Draft Discussion Paper, p 7.

¹⁰² *New Knowledge, New Opportunities: a discussion paper on higher education research and research training*, June 1999, p 10.

¹⁰³ AVCC, p 11.

¹⁰⁴ AVCC, p 11.

¹⁰⁵ Jensen and Thursby, p 7.

¹⁰⁶ Biotechnology Australia, Draft Discussion Paper, p 7.

research discoveries. For example, to measure performance in terms of creation of new business ventures and the generation of knowledge-based employment.¹⁰⁷

The Biotechnology Australia discussion paper ends with the observation that it cannot be assumed Government policy changes can create an appropriate environment for developing effective commercialisation strategies.¹⁰⁸

Possible initiatives

- Public research institution IP policies should set out or reaffirm as their number one priority establishing a culture of innovation through doing excellent research.
- Specialisation and division of labour suggests that:
 - researchers should do research (but need to be aware and involved in the commercialisation process);
 - public research institutions that can achieve the necessary critical mass to provide effective services in specific technology sectors could have a dedicated technology management company having both technical and commercial experts to assist researchers with the necessary skills and early stage capital for IP protection;
 - where institutions lack critical mass to provide IP management services across all areas, researchers should be free to obtain services elsewhere – but possibly will need assistance to manage external service providers to ensure performance.
- Reducing the pressure on academics to publish early might reduce needs for early stage capital for IP protection.
- Consider amending the *Patents Act* to provide a "grace period" as in the US to the effect that early publication is not fatal to patentability provided the application is lodged within a specified period (which would require multilateral implementation).
- Place greater emphasis in publicly funded research on applying resources to commercialisation activities.
- Where institutions are not large enough or do not have the necessary management skills to support a technology management company, possibilities for mergers of such entities to serve a number of institutions should be explored if synergies exist.

¹⁰⁷ Biotechnology Australia, Draft Discussion Paper, p 16. Supported by submission of Mr N A Whiffen to the Working Group.

¹⁰⁸ Biotechnology Australia, Draft Discussion Paper, p 20.

- Encourage such things as networks, clusters, incubators, centres of excellence to facilitate building or sharing management skills to successfully bring IP through to commercialisation.
- Where Australia does not have critical mass to develop or hold the necessary management expertise, pursue commercial alliances to bring in or acquire the needed expertise.

2.3 Overseas practice

Issues

How do the structures and practices for management of IP at selected Australian institutions compare with practices at selected overseas institutions?

Discussion

A study of 62 US universities indicates that most IP policies use model A above – where IP is the property of the institution rather than the researcher – and only two adopted a different policy.¹⁰⁹

Even under a different policy, for example, the University of Wisconsin apparently adopts IP ownership model B, the university requires researchers to submit innovative technology to its IP management foundation for assessment.¹¹⁰ If the foundation accepts the technology, it will take an assignment of the IP ownership in return for giving the researchers and the university department each a share of income. The foundation will handle patenting and cover the costs. If the foundation declines the technology, the researcher is free to deal with the IP rights (subject to any federal funding agency having a right of refusal).

Stanford University apparently adopts model A, and has an Office of Technology Licensing with similar functions, but can transfer the technology to the researcher if the OTL does not wish to take it up.¹¹¹

Under model A institutions surveyed in the US, the average share of commercialisation income allocated to inventors was 40%, with the balance going to the department and the university.¹¹²

¹⁰⁹ Jensen and Thursby, p 5.

¹¹⁰ Wisconsin Alumni Research Foundation "Bringing your invention to WARF", (sourced from the university's internet site: "<http://www.wisc.edu/warf/invbring.htm>").

¹¹¹ Stanford University, "Intellectual Property Resource Page" (sourced from the university's internet site: "<http://www.stanford.edu/dept/DoR/Resources/ip.htm>").

¹¹² Jensen and Thursby, p 9.

2.4 Balance of public/private research funding

Issues

Is the balance between government funding of pure versus applied research appropriate? Are the public sector–private sector partnership schemes working? How can the private sector support of R&D be improved? Is there a case for a "no Australian disadvantage" element in public support for R&D?

Discussion

These issues have been examined by Mortimer and others.¹¹³ Mortimer recommended that the universities should become more focussed on applied than at present where their primary role is pure research, and recommended a more strategic approach to cooperative activities with industry and commerce.

The AVCC responded to the Mortimer Report by acknowledging that cooperative activities with industry are desirable, and that public research institutions were already increasing private sector funding, but expressed disappointment in the Mortimer report for not recommending any specific strategies for achieving target funding outcomes mentioned in the report.¹¹⁴

Mortimer did, however, recommend that universities could make greater use of spin-off companies as a mechanism for technology transfer.¹¹⁵ The advantage of setting up a spin-off company is that it can be wholly-owned by the university before being spun-off, and can immediately take advantage of commercial experience being brought onto the board of the spin-off, both representatives of major commercial collaborators or investors and independent directors if desired – much the same as for Cooperative Research Centres. Such an entity can be the basis for technology transfer and commercialisation.¹¹⁶

The recent Wills Report on medical research and the Biotechnology Australia draft discussion paper suggest that IP ownership rules should provide for researchers receiving equity in spin-off companies to encourage commercialisation.¹¹⁷

A forthcoming study by the Australian Research Council on *University Research: Technology Transfer & Commercialisation Practices* is expected to support these conclusions.

¹¹³ David Mortimer, Report of the Review of Business Programs (Mortimer Report) "Going for Growth" June 1997, pp 122-126.

¹¹⁴ AVCC, Media Release, response to the Mortimer Report, 19 August 1997.

¹¹⁵ Mortimer, p 123.

¹¹⁶ Australasian Tertiary Institutions Commercial Companies Association and Licensing Executives Society "Commercialising Innovation through Spin-off Companies", Conference Papers, September 1999.

¹¹⁷ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, recommendation 4.1.1. Biotechnology Australia, Draft Discussion Paper, p 9.

There is already a strong pattern of strategic alliances between Australian companies and research institutions.¹¹⁸ The recent green paper, *New Knowledge, New Opportunities*, suggests that the key to successful innovation is to facilitate the flow of ideas, creativity and skills between public research institutions and the private sector, and that these linkages need to be increased.¹¹⁹

The general thrust of this paper indicates that the IP system should be adequate to facilitate technology transfer from public research institutions, given effective IP management and a commercial culture, and it may be inferred that those are the areas that need attention. Section 2.2 above has discussed some of these issues.

Section 1.8 above has discussed some investment blockages that also need to be addressed.

Many financiers argue that the emphasis of research spending should be changed in favour of applied research, and more resources should be devoted to developing management skills and creating technologies with a commercial focus, to encourage the flow of commercial funding.¹²⁰ This is a view advocated in Biotechnology Australia's discussion paper on commercialisation of biotechnology.¹²¹

It seems that the finance markets may not proactively seek out opportunities to assist public research institutions with finance through early stages in the absence of substantial secure financial rewards, such as were experienced during the R&D syndication program, which provided guaranteed returns based on tax incentives.

It may be that private funding from industry and commerce is the most feasible way to bridge the gap, and that intervention is best directed in the area of encouraging both public research institutions and industry and commerce to be more proactive in seeking out mutual opportunities. It is necessary to offset the risk in some way. The use of tax concessions for this purpose is a key issue, however, the focus of this paper is initiatives other than taxation.

Only one submission addressed the "no Australian disadvantage" issue as a possible requirement in publicly funded research.¹²² This concerns proposals for Australian firms to license back patentable inventions, for example, in the field of agricultural biotechnology, in order to ensure that the competitiveness and comparative advantage of Australian agriculture were not undermined by unreasonable restrictions on access or excessive prices. This is discussed further in the context of compulsory licensing under TRIPS, in section 4.1 below.

118 Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p43.

119 *New Knowledge, New Opportunities: a discussion paper on higher education research and research training*, June 1999, p 9.

120 Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p 41.

121 Biotechnology Australia, Draft Discussion Paper, p 6.

122 Submission of Sylvia Tulloch, Sustainable Energy Industry Association.

To consider this in more detail it would be necessary to review any "no-Australian-disadvantage" conditions currently or proposed to be imposed on researchers by Commonwealth or State grant authorities, having regard to the corresponding provisions of TRIPS. If such clauses were to be inserted in grant or research contracts it would, in the first instance, be a commercial matter between the parties rather than an issue relevant to the TRIPS provisions.

The issue is not simply a domestic Australian issue, as the TRIPS provisions would come into play overseas. In the case of some WTO member nations, the national authorities may want to include special provisions governing the dissemination of new enabling technologies.

Possible initiatives

- Universities should where possible more actively manage their IP, regardless of the form of IP ownership policy adopted – including spin-off companies as a mechanism to increase linkages with industry and commerce.
- Public research institutions should share the risks and rewards of commercialisation of IP with researchers by allowing researchers equity in spin-off companies.
- Active management would be facilitated by developing management and promotional skills to seek out commercial opportunities.
- Industry and commercial users of IP be encouraged to proactively seek out opportunities to apply public research institutions' IP.

3. CULTURE AND AWARENESS OF IP ISSUES

3.1 Education at all levels

Issues

How can innovation and IP creation be championed in the public eye? Is there scope for the introduction of innovation and IP management subjects in the secondary and tertiary education curricula of science and technology courses?

Discussion

In its broadest definition raising awareness of innovation and IP could involve a cultural shift which would be facilitated by long-term initiatives at all education levels.

The 1993 report of the Science & Engineering Council recommended that there was a need to increase community awareness of the concepts of IP and its value to ensure Australia fulfils its potential as an innovative country.¹²³ The paradox noted by the report is that IP laws are complex and best left to trained professionals, yet small to medium enterprises and higher education research institutions were thought to be missing out on effective IP

¹²³ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, p 11.

protection through lack of awareness.¹²⁴ The cost of getting appropriately skilled advice was not raised in the report as a possibly relevant factor, but seems to have emerged in recent times – this is discussed in section 3.3 below.

The report discussed possible use of science education programs in secondary education as a means of targeting young people to increase their awareness of IP.¹²⁵

The Working Group acknowledges that since the release of that report, there have been a number of attempts made to achieve greater understanding of commercial issues among students and researchers in order to encourage increased entrepreneurial behaviour. Some of these programs, such as DETYA's Enterprise Education in Schools Program, do not specifically cover IP awareness. The likelihood, however, is that students will increase their awareness of issues of IP as a result of a general focus on commercial matters. IP Australia has specifically targeted IP awareness among school-age children with the "Ippy Online" section of its website. This section of the website recently won the Australian Multimedia Industry Association award for the best Young Adult Web Site. These developments are likely to have some impact in fostering overall IP awareness, although this is likely to take time.

One submission to the Working Group suggested that the general lack of awareness of IP rights in the community is associated with a culture that condones software piracy and disregards IP creation and protection regimes – part of the solution therefore is greater community emphasis on enforcement of IP rights.¹²⁶ Enforcement issues are addressed in section 5 below.

Possible initiatives

- Develop awareness of IP through adding IP content to science and technology programs for secondary school students.

3.2 Business skills

Issues

How can key stakeholders be become better informed about innovation, IP and commercialisation? How can the negotiation of the commercialisation of IP be improved?

Discussion

The process of informing stakeholders about IP issues in the context of innovation and commercialisation can be tackled at a number of levels. It may require targeted intervention throughout high school and university in subjects ranging from law and business to the more obvious areas of science and engineering.

¹²⁴ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 11-13.

¹²⁵ Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, p 15.

¹²⁶ Submission of McDonald & Associates, Solicitors.

The recent Biotechnology Australia discussion paper suggests that researchers need formal training in business, management, communication and negotiation skills, and so do technology managers in public research institutions.¹²⁷

It should not come as a surprise that studies show that scientists lack the skills to commercialise IP.¹²⁸ Presumably the community is better served by its scientists producing good science.¹²⁹

It seems clear, however, that scientists need to be effective users of the services of technology managers, lawyers and patent attorneys.¹³⁰ For any user of services to get value for money they need to know how to manage the service provider.

The recent ACIP report recommended that IP Australia develop and deliver education programs to help owners of IP rights understand and manage those rights.¹³¹ IP Australia has recently produced an impressive multi-media CD-ROM, *Get Smart with IP: A Quick Guide to Managing Your Intellectual Property*.¹³² This provides information about the IP system in Australia and, importantly, case studies of Australian businesses and how they have protected their IP.

One may query whether service providers also bear some responsibility to make their advice user friendly and commercially relevant. No doubt most lawyers and patent attorneys have the necessary expertise and are commercially focussed, however, there is a suggestion in the Biotechnology Australia discussion paper that there is a lack of expertise in such firms in the biotechnology area.¹³³ It may well be that in fast moving areas of technology everyone is on a steep learning curve.

The recent Wills Report recommended increased Government funding of both pure and applied medical research, and broadening the funding base through private funding.¹³⁴ The Report recommended that researchers should receive graduate training in management, IP and regulation.¹³⁵

¹²⁷ Biotechnology Australia, Draft Discussion Paper, p 18.

¹²⁸ Biotechnology Australia, Draft Discussion Paper, p 7.

¹²⁹ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, p 3.

¹³⁰ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, p 3.

¹³¹ Advisory Council on Industrial Property, *Review of Enforcement of Industrial Property Rights*, March 1999, p 14.

¹³² See IP Australia website ("<http://www.ipaustralia.gov.au>").

¹³³ Biotechnology Australia, Draft Discussion Paper, p 13.

¹³⁴ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, pp 9-10.

¹³⁵ Health & Medical Research Strategic Review Committee, Final Report, *The Virtuous Cycle*, May 1999, p 4.

As outlined in Section 3.1, the Working Group notes that there are some initiatives under way are attempting to address this. For example, the Victorian Department of Education, in conjunction with universities, is developing a series of training modules for science researchers that focus on business planning and entrepreneurship for university research students. IP management will be a key focus within this program.

Similar training programs have been conducted by other organisations (e.g. Strategic Industry Research Foundation, CRCs) in recent times, in which IP management has been a major theme. Networking arrangements which attempt to link researchers with business (one example is the BizScience initiative, run by the Committee for Melbourne) are also considered likely mechanisms to foster greater understanding by researchers of commercial issues such as IP rights. Whilst the Working Group is encouraged by such developments, it notes that most are relatively recent and small scale. Their impact in producing significant cultural change, in the short term at least, is unlikely to be great.

The other gap, which there are less apparent efforts being made to address is the lack of knowledge about overseas IP markets, how they operate, the potential problems and pitfalls, case studies of successes and so on. It could be argued that given the small size of the Australian market, information about the IP regimes of our major trading partners is of greater importance to individuals and companies intent on commercialising IP than information about the Australian IP system. This is an area which requires specific factual information, and "war stories", rather than the more generic advice and awareness raising covered by the initiatives mentioned above.

Some commentators believe that there is no shortage of expertise in these matters in the global marketplace if Australian organisations are prepared to pay market rates – which are generally above Australian rates for managers and service providers.

Possible initiatives

- Run more training in business, management, communication and negotiation skills for researchers and technology managers in public research institutions.
- Run training for researchers and technology managers in public research institutions and managers of small to medium enterprises in the strategic use of IP advisers in commercial negotiations and for risk management purposes – drawing on international expertise to ensure we achieve world best practice.
- Run courses/information sessions for researchers and technology managers in public research institutions and managers of small to medium enterprises that focus on the specifics of IP regimes in our major trading partners.

3.3 Portfolio management of IP

Issues

How do we improve the IP management skills of the Australian research community as well as public and private sector managers?

Discussion

In the corporate and academic sphere many innovative products and processes are patented. However because many managers do not appreciate the role IP plays in raising funds for R&D and commercialisation, or the value of intellectual property, these patents often remain locked up within the institution and are not commercialised for the benefit of the organisation or the broader public good.

The process of unlocking this potential by improving the management of IP is a key issue.

Industrial companies have increasingly large amounts of money tied up in intangible assets. For example, Monsanto Company at 30 June 1997 had US\$1 billion invested in patents and other intangible assets.¹³⁶ These assets need to be actively managed to minimise IP protection costs and maximise commercialisation income.¹³⁷

Not all patentable IP needs to be patented, if commercial factors indicate secrecy may be more effective, for example, some process technology, however, such decisions need to be managed. University IP management companies often have websites to provide information to assist researchers understand basic IP law and to provide on-line disclosure of innovation to advisers so it can be captured and assessed before public disclosure.¹³⁸

Effective management should also minimise the risks of infringing third party IP rights.¹³⁹

A number of submissions to the Working Group suggested that cost of advice on IP matters is a major issue, particularly for start-up companies.¹⁴⁰ A key concern was the major client base of Australian patent attorneys and lawyers is multinationals protecting their IP in Australia, and there is a perception that costs adversely affect the ability of Australian researchers and small to medium enterprises to compete effectively.¹⁴¹

Some commentators would disagree with those submissions, at least in relation to patents, on the basis that charges by Australian patent attorneys for advice are significantly lower than charges in most countries, particularly our major competitors of Japan, US, Europe and South East Asian. This of course concerns relative costs, however, the Institute of Patent and Trade Mark Attorneys of Australia runs a free advice service.

Some commentators would also disagree that because the major client base of Australian patent attorneys is multi-nationals with deep pockets the cost of services in Australia is supported at a high level. Arguably, were it not for the fact that patent attorneys are processing significant numbers of cases for international clients, they would not be able to employ experts in the wide range of technical disciplines that they do, and overhead costs

¹³⁶ Monsanto Company, 1997 Annual Report (sourced from the company's internet site: "<http://www.monsanto.com>").

¹³⁷ Mary Padbury, "Managing Intellectual Property", Blake Dawson Waldron Seminar Paper, April 1998, p 5.

¹³⁸ Stanford and Wisconsin mentioned above (see also Uniquist: "<http://www.uniquist.com.au>").

¹³⁹ Mary Padbury, "Managing Intellectual Property", Blake Dawson Waldron Seminar Paper, April 1998, p 6.

¹⁴⁰ Submissions of Australian Business Ltd, Ernst & Young Law, QUT.

¹⁴¹ Submissions of Mr Darryl Mischlewski.

would be spread over a smaller volume of work. The international work sustains the capacity of expertise that is then available to Australian industry and research.

Some commentators believe that it makes little sense for research grants to fund research without providing funding for IP protection or early stage commercialisation activities. Government programs such as COMET and the Technology Commercialisation Program in Victoria which are intended to address this are discussed in Section 1.8.

A detailed study of IP protection and service provider costs would be useful, but is beyond the scope of this paper.

Possible initiatives

- Institutions themselves may be reluctant to divert funds away from research to pay for best practice business, legal and IP advice, so there may be merit in state or federal government programs to facilitate or subsidise this assistance.
- Institutions and start-up enterprises may have limited budgets to establish portfolio management systems, so there may be merit in state or federal government programs to provide such assistance, preceded by IP audits to check the accuracy of information systems covering IP rights and IP contracts. Any assistance provided in this area needs to be user-driven to reduce complexity of administration and encourage researchers to make use of these programs.

4. CREATING AN IP SYSTEM WHICH SERVES AUSTRALIA'S STRATEGIC INTERESTS

4.1 More strategic use of the patent system

Issues

How could the IP protection system better serve Australia's strategic interests?

Discussion

It may be argued that Australia needs to use its patent system more strategically, as does the US, to further its own interests. Methods of facilitating this transformation include making patents more difficult to obtain (by raising the threshold required for an innovative step) and ensuring that the application of patents is restricted. While this might be calculated to result in free use of innovation in Australia, it would probably send Australian inventors offshore to gain IP protection and prevent foreigners funding R&D in Australia.

On the other hand, strengthening the Australian system would not necessarily be advantageous for indigenous companies engaged in innovation. As the majority of Australian patents are granted to overseas companies, increasing the strength of local patents would actually work against many indigenous companies seeking to utilise offshore intellectual capital.

See further the discussion under section 1.5 above. Australia's best interests would appear to be served by complying with the minimum standards required under TRIPS.

One submission to the Working Group suggested that recent changes to US patent laws provides US inventors unfair protection compared to other countries by lowering the requirement for patentability.¹⁴² On the other hand, recent press reports suggest patent reform legislation in the US, to bring US patent laws more into line with Europe and Japan, for example by adopting the "first to file" priority system and requiring publication of patent applications within 18 months after filing, is a hot political issue.¹⁴³

The United States Patent Reform Bill passed the House of Representatives on 18 November and passed the Senate on 19 November. The Bill now goes to President Clinton for signature. He has indicated that he will sign it. The Bill does not change the "first to invent" principle. The new law includes the following:

- Publication of applications in most cases at 18 months. This now brings the US into line with other countries, such as Australia.
- Allowing provisional applications as a basis for priority under the Paris Convention.
- A minimum of 17 year patent term including patent term extensions for administrative delay for up to 30 years from the date of first filing (something Australia could well consider).
- Fee reductions.

See further section 4.4 below regarding the "innovation patent". Australia's best interests would appear to be served by creating a second tier patent with a lower threshold required for an inventive step to favour local small to medium enterprises.

A further issue, which underpins the compulsory licensing provisions in TRIPS, is how countries can ensure that they can obtain the benefits of new, patented inventions within a reasonable time-frame, on fair terms, and at an appropriate cost.

The TRIPS provisions have been treated as an option of last resort, as member nations have been concerned at the adverse effects on TRIPS' credibility (as well as possible retaliation) which might follow from widespread use of compulsory licensing rules. Further, as compulsory licensing would take control of commercialisation of technology away from the IP owner, there could be adverse effects on innovation, foreign investment and technology transfer.

There is a lack of international case law and decisions of dispute settlement panels on this matter as the terms of Article 40 on anti-competitive practices have not yet been tested.

A compulsory license is an involuntary contract between a willing buyer and an unwilling seller imposed and enforced by the State.¹⁴⁴

¹⁴² Submission of Dr Gavin Tulloch, Sustainable Technologies Australia.

¹⁴³ Cyndia Zwahlen, "Small business – mind to market – big firm, independents at odds on patent plan", Los Angeles Times, 13 October 1999, p 8.

¹⁴⁴ Gorecki, Economic Council of Canada (1981).

Surveys suggest that compulsory licensing procedures are most often used where a dependent patent is being blocked, or where a patent is not being worked, or where an invention relates to food or medicine.¹⁴⁵

Article 40 of TRIPS is a general article addressing "control of anti-competitive practices in contractual licences", and it therefore supplements the specific TRIPS clauses on patent rights and protections. Those patent Articles (especially Articles 30 and 31, taken together) provide only for limited exceptions to monopoly patent rights. The relevant section of Article 30 provides for "limited exceptions" to exclusive patent rights, "provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties". The key test would be determining whether the legitimate interests of the rights holder had been unreasonably prejudiced. This test is currently being applied in a dispute between the EU and Canada on springboarding of pharmaceutical patents, a dispute in which Australia is involved as a third party.

Use of compulsory licensing would fall outside the framework of Article 30 exceptions, because the practice would likely be treated not as an outright "exception" but as a limitation on the exercise of rights.

Article 31 sets disciplines on compulsory licensing and government use of patented inventions, and confirms that such measures – within set limits – may be applicable as remedies to anti-competitive practices (31.c, 31.k).

In cases where behaviour by the patent holder could not reasonably be classified as anti-competitive (TRIPS Article 31.k), TRIPS sets out certain guidelines intended to constrain and discipline any attempt to limit the rights of the patent holder (at Article 31.b-j). Those guidelines are common sense ones; they require that authorisation should be granted on the merits of individual cases (so that there could not be, for instance, an authorised blanket licensing regime covering all pharmaceuticals), and they state that "other use without authorisation" by the patent holder should only proceed after efforts to obtain authorisation "on reasonable terms and conditions", should be limited in scope and duration, should be non-exclusive and non-assignable, should entail payment of adequate remuneration to the rights holder, and should be predominantly for the domestic market.

The clauses most pertinent to any compulsory licensing case would be assessments of the efforts made to obtain access on reasonable terms and conditions (Article 31.b) and the compensatory remuneration paid (31.h).

In addition to the patent Articles, Article 8 authorises countries to take "appropriate measures" to prevent "the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology".

Article 40, however, offers broader remedies against "some licensing practices or conditions pertaining to intellectual property rights which restrain competition", specifically where those anti-competitive practices adversely affect trade or technology transfer.

¹⁴⁵ d'Amato and Long (1997).

In "particular cases", to rectify a demonstrated "abuse of intellectual property rights", member nations are authorised to take "appropriate measures". An indicative list of potentially abusive practices is included to give a common sense application to the provisions. That list includes: exclusive grantback conditions; conditions preventing challenges to validity; and coercive packaging licensing.

The remainder of the Article specifies consultation procedures, designed to guarantee that information is made available and that "adequate opportunity" for consultations is permitted. This is Article 40.3 and 40.4 outline preliminary steps intended to ensure that processes of information exchange and mediation are completed before Members consider bringing a dispute. The provisions in Article 40 mirror those elsewhere in the WTO Agreements, but are marginally more formal, and more specific.

The list of potentially anti-competitive practices in Article 40 is neither definitive nor exhaustive. A longer list of indicative examples was considered during the TRIPS negotiations. It would be possible, for instance, to include other practices such as: exclusive dealing; tying arrangements for further production lines; price restraint; cross-licensing; pooling of rights; restrictions on adaptations of technology; exclusive sales or representation conditions; or export bans. There would also be scope for national remedies through nullification of certain anti-competitive practices, or – as a last resort, revocation of the patent.

There is currently no proposal to insert a revision of Article 40 into the framework of the TRIPS review. The provisions would be refined, clarified and tested by the usual WTO processes of dispute settlement, if and when a dispute on allegedly anti-competitive practices was notified.

4.2 Administration of IP policy

Issues

Is the diversity of portfolio responsibility for IP administration optimal? The advantages and disadvantages of centralising responsibility for IP policy development and administration in one department should be considered. Should an 'IP champion' portfolio/position be established?

Discussion

The existing system which divided responsibility among a number of departments has a range of benefits. Chief among these benefits is the opportunity for greater influence afforded by having a number of ministers with portfolio responsibilities for the IP system.

On the other hand, the fragmentation of responsibility meant that IP was a side issue for many ministers and did not receive the attention it deserved. Centralisation of responsibility would facilitate the centralisation of focus within government, creating an advocate for IP policy.

The Working Group commissioned a separate paper by Professor Sam Ricketson of the Monash University Faculty of Law to discuss in detail issues and options in this area. As that paper provides a full coverage of the issues, it is not proposed to go into any detail here.

There appear to be two broad options (first two dot points below). The Working Group has not reached a concluded view on the preferred option.

Possible initiatives

- Establish a single ministerial control and administration for all areas of IP, with responsibility to establish a consultative body representing all bodies involved in the use and administration of IP.
- Establish a body having the function of liaising between different portfolios and coordinating the process of policy formulation and drafting of IP legislation to implement law reforms.
- A "single entry point" website could be established to coordinate enquiries concerning IP falling under different portfolio responsibilities.

4.3 The protection of non-patentable IP

Issues

Are current protection mechanisms available in Australia adequate for this type of intellectual property? Should our IP protection system safeguard non-traditional intellectual property, such as business methodologies, or should other protection mechanisms be utilised?

Discussion

Not all patentable IP needs to be patented, if commercial factors indicate secrecy may be more effective, for example, some process technology. However, the public benefit from patents is technology diffusion – information about the patent is available to the research community for research purposes, so spillover benefits can be achieved.

The recent Biotechnology Australia discussion paper asserts that protection of confidential data provided in Australia as part of marketing approval applications required under GATT/TRIPS remains a concern to the international biotechnology industry.¹⁴⁶

The extension of similar protection to currently non-patentable IP would appear to require universal international adoption to be effective.

The Intellectual Property & Competition Review Committee Issues Paper poses the question whether common law protection of IP could be a suitable alternative to legislative protection of IP rights.¹⁴⁷

Possible initiatives

- Strengthen Australian legislation if necessary to protect commercial-in-confidence information submitted to Government authorities.

¹⁴⁶ Biotechnology Australia, Draft Discussion Paper, p 14.

¹⁴⁷ Intellectual Property Competition Review Committee, Issues Paper, September 1999 ("<http://www.ipcr.gov.au>"), p 23.

4.4 Flexibility of the IP system

Issues

How might the IP administration system be improved? Is our IP regime sufficiently flexible for fast developing new technologies? Does our IP system adequately protect new inventions such as methods of doing business and software inventions? Does the IP system encourage or discourage spillover benefits of research in the form of spreading non-proprietary personal skills through the research and business community in the most effective way?

Discussion

Patents

In February 1997 the Government announced that it proposed to implement a new "innovation patent" system to replace the petty patent system.¹⁴⁸ This proposal accepted the recommendations of ACIP that there was a need for IP rights for incremental or lower level inventions that would not be sufficiently inventive to qualify as standard or petty patents. It was envisaged that the new system would provide cheap and fast IP protection for small to medium enterprises. The Government noted that 48 other industrialised countries including Germany and Japan had introduced similar systems in recent years to provide better access to IP protection for local industry.

The Government proposed that, as in other countries, innovation patents would be granted after only a "formality" examination as opposed to a substantive examination. Consequently, it was proposed that the owner of the patent could not sue a third party for infringement of the patent until a substantive examination was completed.

To date this proposal to introduce the "innovation patent" has not been implemented.

Effective from January 1999 the Australian patent legislation was amended to allow for an extension of a patent's term for up to 5 years for pharmaceutical substances for human use.¹⁴⁹

Some commentators question whether, in view of long lead times and increasing regulatory involvement in other areas of biotechnology, there ought to be a wider provision for extension.

Judgment of the Full Federal Court is awaited in a case concerning the patentability of methods of medical treatment of the human body, which on the basis of earlier authority is regarded by the Australian Patent Office as patentable.¹⁵⁰

¹⁴⁸ "Introduction of the Innovation Patent", February 1997, Government Response to the Recommendations of the Advisory Council on Industrial Property Report *Review of the Petty Patent System*.

¹⁴⁹ Intellectual Property Laws Amendment Act 1998.

¹⁵⁰ FH Faulding & Co Ltd v Bristol-Myers Squibb Company.

Designs

The Government announced in February 1999 that the Designs Act would be amended to provide clearer definitions, stricter eligibility and infringement tests, a more streamlined registration system, and better enforcement and dispute resolution procedures.¹⁵¹

Changes proposed include:

- Introducing an eligibility test that requires that the design be both new and distinctive;
- Expanding the prior art base to include use or publication anywhere in the world;
- Adopting a more streamlined examination system under which registration would be granted after only a "formality" examination as opposed to a substantive examination;
- Reducing the maximum term of design registration from 16 to 10 years;
- A review of the application of the new system to spare parts including motor vehicle spare parts.

To date this proposal has not been implemented.

Copyright and Circuit Layouts

These two areas of IP law are administered by the Attorney-General's Department, and so will be dealt with together.¹⁵² The following discussion draws heavily on the Department's submission.

One submission received by the Working Group proposed that, in the fast-moving area of IT, the key to innovation is to develop new approaches to managing and licensing IP – although some questions are raised about the adequacy of contractual licenses to cover a sub-licensing chain, the challenge seems to be regarded as a management issue.¹⁵³ Other submissions suggested IP protection laws need to be made more robust in their recognition of rights in the full range of "information economy" assets such as digital media.¹⁵⁴

The legislative framework for copyright protection in Australia is underpinned to a large extent by Australia's international obligations. Those international obligations are extensively codified in the *Berne Convention for the Protection of Literary and Artistic Works* (the Berne Convention), which lays down a widely accepted model of minimum standards of copyright protection for its member countries. For circuit layouts, relevant international standards are

¹⁵¹ Press Release 013/99 Parliamentary Secretary to the Minister for Industry, Science & Resources, 16 February 1999.

¹⁵² Submission to the Working Group by the Attorney-General's Department.

¹⁵³ Submission of Peter Higgs, IPR Systems Pty Ltd.

¹⁵⁴ Submission of Pacific Advanced Media Studio Pty Ltd & Hooton & Perkins, Solicitors.

set out in the *Treaty on Intellectual Property in Respect of Integrated Circuits 1989* ("**Washington Treaty**"). Australia is not a member of the Washington Treaty.

The TRIPS Agreement substantially incorporates the standards set out in the Berne Convention and Washington Treaty, although building on them to some extent. It also adopts or incorporates in large measure, standards under other treaties dealing with copyright or related rights – principally the *International Convention on the Protection of Performers, Producers of Phonograms and Broadcasting Organisations* ("**Rome Convention**"), to which Australia has been a member since 1992.

The protection afforded in Australia to copyright material under the *Copyright Act* and to circuit layouts under the *Circuit Layouts Act* substantially reflects Australia's international obligations under the Berne convention, the Rome Convention and the TRIPS Agreement.

There is no registration system for copyright nor for the granting of rights in the layout designs of integrated circuits – protection is automatic.

In Australia, copyright has traditionally been treated as an economic right, designed to promote innovation in two broad ways:

- to provide economic incentive for the creation of particular forms of material by granting the copyright owner a number of rights in that material. The most commonly valuable copyright rights are the right of reproduction and the "performing" rights (that is, the rights concerning public performance, broadcasting and cable diffusion of copyright material); and
- to appropriately limit the scope of those rights to ensure that copyright material can be used for the broader public benefit in access to information, and to encourage derived innovation.

The rationale for the protection granted under the *Circuit Layouts Act* mirrors those aims (though the nature of protection varies in so far as the rights and duration of rights are substantially less than under copyright).

A number of reviews are being undertaken on aspects of copyright protection in Australia:

- The House of Representatives Standing Committee on Legal and Constitutional Affairs is inquiring into the enforcement of copyright in Australia and is also examining the *Copyright Amendment (Digital Agenda) Bill 1999* (introduced into Parliament on 2 September 1999).¹⁵⁵
- The Copyright Law Review Committee is undertaking an inquiry on the need for changes to the jurisdiction and procedures of the Copyright Tribunal. The Committee is due to report by 30 April 2000.¹⁵⁶

¹⁵⁵ See the Committee's website ("<http://www.aph.gov.au/house/committee/LACA/index.htm>").

¹⁵⁶ See the Committee's website ("<http://www.law.gov.au/clrc>").

- The Intellectual Property and Competition Review Committee, which is due to report to the Attorney-General and the Minister for Industry, Science and Resources by 30 June 2000, has released an issues paper¹⁵⁷ that raises a number of issues concerning the impact of the following on competition:
 - *Copyright Amendment Act (No. 1) 1998* and *Copyright Amendment Act (No. 2) 1998*, which introduced important reforms to the Copyright Act, including changes to allow the parallel importation of sound recordings, to allow the parallel importation of copyright packaging and labelling, to ensure that newspaper and magazine publishers retain electronic and residual rights in the works of employed journalists and to give the courts a discretion in awarding conversion damages for copyright infringement.
 - *Copyright Amendment (Computer Programs) Act 1999*, which will, among other things, encourage copyright owners in computer programs to make information about their programs (such as interface specifications) available for the purpose of error correction, making compatible products and for security testing of computer networks (or if this information is not readily available from the copyright owner, others will be allowed to decompile programs for these purposes).
 - *Copyright Amendment (Digital Agenda) Bill 1999*, which will, if passed, introduce significant changes to address the challenges for copyright protection posed by new communications technologies, particularly the Internet. The centrepiece of the Bill is a new technology-neutral right of communication to the public which will replace the existing technology-specific broadcasting and cable diffusion rights. The Bill will, if passed, ensure that copyright law continues to balance the promotion and protection of innovation with the needs of the public to access copyright material in the digital environment.
 - The trend in the EU and US to longer copyright duration, and whether Australia should follow suit.
 - The operation of collecting societies such as the Australasian Performing Right Association, in the light of the decision of the Australian Competition Tribunal on 16 June 1999 that authorisation under the TPA should not be granted for some of APRA's activities.
 - The approach that should be adopted under the Copyright Act to "proxy caching" by Internet service providers.

Two papers were published recently discussing the economic significance of copyright protection and the importance of protecting digital material, *The Economics of Copyright and the Digital Agenda* and how this can be balanced with the interests of users in the free flow

¹⁵⁷ Intellectual Property and Competition Review Committee, Issues Paper, September 1999.

of information, *Copyright in the New Communications Environment: Balancing Protection and Access*.¹⁵⁸

The Attorney-General's Department submitted that there is a strong professional base for advising Australian business on their rights and obligations, and the opportunities provided by Australia's IP legislation.

The issue of complexity and cost of obtaining professional assistance with IP laws is discussed in section 3.3 above.

While the Advisory Council on Industrial Property is established to advise the Minister on issues referred to it on the policy and administration of patents, trade marks and designs, at present there is only limited research on policy issues associated with intellectual property, particularly its impact on economic development and competitiveness.

With the growing importance of the knowledge based economy to wealth creation the need for such research to underpin effective policy development will increase. To be of most benefit such policy research will need to be multi-disciplinary, cutting across economic, commercial, legal and scientific issues. An IP research program would not only provide information for sound policy advice on all areas of IP, it would also serve to promote awareness of IP issues among politicians and bureaucrats as well as the broader community, streamlining the policy response to changing circumstances.

This model was adopted in the UK with the formation of the Oxford Intellectual Property Research Centre, founded with an endowment from Hitachi.¹⁵⁹

To encourage the formation of an Australian multi-disciplinary IP research centre the Government, perhaps through IP Australia, could provide funding for a small research program for say three years. The centre could also seek funding from other sources. It should also be encouraged to establish strong links with other relevant research groups both in Australia and overseas.

Possible initiatives

- Streamline the process of policy response to emerging technologies and emerging problems with the IP system to reduce the lead time for effecting change in the IP system.
- Establish an IP research centre, funded by Government and/or industry, possibly through the auspices of IP Australia, to provide independent multi-disciplinary input into IP policy formulation and ensure effective input from users of the IP system.

¹⁵⁸ Hans Hoegh Guldberg, Economic Strategies Pty Ltd, *The Economics of Copyright and the Digital Agenda*, Copyright Agency Ltd, October 1999. Ian McDonald, Australian Copyright Council, *Copyright in the New Communications Environment: Balancing Protection and Access*, Centre for Copyright Studies, October 1999.

¹⁵⁹ Oxford Intellectual Property Research Centre website ("<http://users.ox.ac.uk/~mast0140/Aim.htm>").

- Streamline the process of drafting of IP legislation to implement law reforms to reduce the lead time for effecting change in the IP system.
- Consider amending the Patents Act to provide for extension of patent terms based on justification on evidence of regulatory processes reducing effective patent life (which requires careful balancing of competing interests).

4.5 Technology transfer

Issues

Does our IP system adequately facilitate technology transfer?

Discussion

Technology transfer in a narrow sense is the assignment or licensing of IP rights. In this sense a system for the protection and recognition of IP facilitates transfer to users who can afford it. Whether this in turn facilitates innovation is another question.

The existence of IP rights may act as an impediment to innovation by those who are not the owners of the IP. For example, the existence of a patent on a process may be an impediment to the innovative improvement of that process, and to the use of that process to produce an innovative product, by a person other than the patent owner.

But sometimes there is an incentive to invent round an existing patent, or invest to leapfrog the patent when it expires.

Further, as noted in the discussion under section 1.5, Australia as a net technology importer stands to capture spillover benefits of technologies developed elsewhere.¹⁶⁰ A number of commentators suggest that Australian researchers and industry could better manage the strategic use of databases of international patents. One submission suggested a program to support the establishment of independent technology brokers to facilitate this process.¹⁶¹

Whether such capture is possible will depend upon the ability of Australian industry to add value either in terms of incremental technology or manufacturing capacity.

Australia's IP system facilitates licensing and technology transfer, however, a vital aspect of successful export of technology is reciprocal enforcement and recognition of Australian IP overseas.¹⁶²

¹⁶⁰ BIE, 1994, p 19.

¹⁶¹ Submission of Lasantha Perera, Technology Access Centre of Australia.

¹⁶² Office of the Chief Scientist, "The Role of IP in Innovation", AGPS 1993, Vol 1, pp 8-9.

4.6 International harmonisation

Issues

Does Australia's position on international treaties and conventions concerning IP harmonisation best serve the country's interests? How should Australia respond domestically to the WTO Agreement on Trade-Related Aspects of IP Rights?

Discussion

Strong, internationally consistent IP systems are the foundation of effective exploitation and protection of IP rights in a globalised trade environment.¹⁶³ Increasing use of a nation's IP system by non-residents is a global trend, and it seems likely that pressures to ease cost and complexity of international IP protection will lead to increasingly harmonised IP systems.¹⁶⁴ An OECD report suggests that further simplification and convergence of patent systems is needed to stimulate innovation and technology diffusions at the global level.¹⁶⁵

The National Competition Council recently recommended:¹⁶⁶

- (a) tightening the IP exemption in the Trade Practices Act so it does not exempt price and quantity restrictions and horizontal arrangements;
- (b) preserving the IP exemption for exclusive licences, territorial restrictions and clauses requiring the licensee to use best endeavours to promote the technology.

The Council noted that United States competition law does not provide any form of exemption for conditions in IP licences and assignments, but that in the European Union the Courts have considered dealings within the scope of rights granted under the IP statute to be immune from the application of competition law, and authorities have issued a block exemption for a limited range of conditions such as in paragraph (b) above.¹⁶⁷

The Council recommended against adopting the EU "scope of rights" exemption in Australia because of uncertainty arising from recent Court decisions.¹⁶⁸

The Council concluded that OECD countries apply competition law more rigorously to conditions of assignments and licences of IP, which would apply to commercialisation of Australian IP in overseas markets. The Council concluded that less rigorous competition

¹⁶³ ACIP Report "IP Australia's International Strategy", 1998, pp 8-9.

¹⁶⁴ ACIP Report "IP Australia's International Strategy", 1998, pp 14-15. OECD, *Patents and Innovation in the International Context (OCDE/GD(97)210, 1997*, p 8.

¹⁶⁵ OECD, *Patents and Innovation in the International Context (OCDE/GD(97)210, 1997*.

¹⁶⁶ National Competition Council, pp 151-152.

¹⁶⁷ National Competition Council, pp 150 and 186-192. See also Appendix 5 "International Experience of IP".

¹⁶⁸ National Competition Council, pp 235-237.

laws applying to IP in Australia would not deliver a comparative advantage favouring investment in R&D and innovation in Australia.¹⁶⁹

The Council concluded that there is nothing in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS") or earlier International IP Conventions to restrict Australia's right to apply competition law to IP.¹⁷⁰ On the contrary, Article 40 of TRIPS acknowledges that there are certain restrictive licensing practices which may adversely affect trade and technology transfer, and member States are permitted to control such practices.

See further the discussion under section 1.5 above. Australia's best interests would appear to be served by complying with or exceeding the minimum standards required under TRIPS.

A discussion paper prepared by IP Australia in 1996, *Patentability Standards*,¹⁷¹ notes a contention that broadly the test for patenting in Australia is in line with the major OECD countries that one would expect Australia to be in line with – USA, Japan, and Europe. As noted in section 5.3 below, there is some room for change in the area of "balance of probabilities/benefit of the doubt" but there is continuing debate about whether the standards adopted in Australia are less stringent than comparable other countries and so should be changed.

The IP Australia discussion paper notes contentions that a statutory duty should be imposed on applicants to disclose prior art including pending patent applications in foreign countries.¹⁷²

The ISR submission to the Intellectual Property and Competition Review Committee comments on the concern that the Australian patent system may provide a lower standard of patentability than for example the US or Europe.¹⁷³ The Australian test of obviousness, it may be argued, is more lenient in two closely related respects:

- (a) In Australia, the prior art base for determining an inventive step is limited to that which forms part of the common general knowledge of a person skilled in the art in Australia, to which may be added the information in any one document which the person skilled in the art in Australia could be reasonably expected to find, understand and regard as relevant (according to generally accepted interpretation of sections 7(2) and (3) of the Patents Act 1990). The position in the US and Europe is that the prior art base includes what is known in the country as well as publications throughout the world (although some commentators believe that in practice obviousness is applied by the patent authorities from a national viewpoint). The 1984 report of the Industrial Property Advisory Committee recommended changing

¹⁶⁹ National Competition Council, pp 199-200 and 219-220.

¹⁷⁰ National Competition Council, pp 227-230.

¹⁷¹ IP Australia, Discussion Paper *Patentability Standards*.

¹⁷² IP Australia, Discussion Paper *Patentability Standards*, p 8.

¹⁷³ Department of Industry Science & Resources, "Submission to the Intellectual Property and Competition Review", November 1999, p 21.

the Australian legislation regarding the prior art base to provide for "universal obviousness", that is, to include all documentary information publicly available anywhere in the world, which a person skilled in the art could be reasonably expected to find, understand and regard as relevant.¹⁷⁴

- (b) In Australia, a new combination of known items ("mosaicing") may not be considered to be obvious, if the known items came from very different fields of technology. In assessing obviousness in Europe and the US it is permissible to combine documents not forming part of common general knowledge. Australian and early English case law regards it as unfair to inventors to apply hindsight in such circumstances to disqualify an invention on the grounds of obviousness.¹⁷⁵ Current English law would not regard mosaicing as unfair, because England has been a member of the European Patent Convention (EPC) since 1977 and the EPC expressly permits mosaicing. The 1984 report of the Industrial Property Advisory Committee recommended against permitting general combination of items in assessing obviousness in Australia.¹⁷⁶

The ISR paper notes that the consequences of the Australian patent system providing a lower standard of patentability than major IP exporting countries, for example the United States and Europe, could mean that:¹⁷⁷

- Australia offers patent protection more readily both to Australians and to foreigners. This could lead to increased prices for Australian consumers who use imported technologies.
- The same level of protection would not be available in other countries. This could lead to reduced opportunities overseas for Australian inventors.

The case studies indicate that differences between national IP systems raise issues that must be managed by IP managers. While these matters are important, opinions differ on them, and it is difficult to draw any conclusions whether the above matters significantly impede or enhance innovation in Australia.

Australia has recently become a member of the Trade Marks Law Treaty and is expected to become a member of the proposed Patent Law Treaty in May 2000, for which discussions are at an advanced level.

Possible initiatives

¹⁷⁴ Industrial Property Advisory Committee, "Patents, Innovation and Competition in Australia", August 1984, section 7.2.

¹⁷⁵ *Minnesota Mining and Manufacturing Co and 2M Australia Pty Ltd v Beiersdorf (Aust) Ltd*, 29 ALR 29. *British Westinghouse Electric and Manufacturing Co Ltd v Braulik* 27 RPC 209.

¹⁷⁶ Industrial Property Advisory Committee, "Patents, Innovation and Competition in Australia", August 1984, section 7.2.

¹⁷⁷ Department of Industry Science & Resources, "Submission to the Intellectual Property and Competition Review", November 1999, p 20.

- Support harmonisation domestically and encourage and support countries in Australia's region to develop their IP systems.

5. COURTS AND ENFORCEMENT

5.1 The record of the Courts

Issues

What is the record of Australian courts in upholding the rights of patent holders in enforcement actions? What is the effect of court structure upon patent decisions?

Discussion

This section of the paper is drawn from the recent ACIP paper *Review of Enforcement of Industrial Property Rights*.¹⁷⁸

The subject of that report was initially referred to IPAC in 1988. The IPAC report *Practice and Procedures for Enforcement of Industrial Property Rights in Australia* was delivered in 1992. No submissions were made to IPAC by commerce and industry, and the Government did not respond to the report.¹⁷⁹

There have been perceptions that Australian Courts rarely uphold the rights of patent holders in enforcement actions. However, this may not necessarily still be the case, and perceptions can be unreliable in a system where 90% of litigation does not go to trial and the cases ultimately decided by the Courts cannot achieve an approval rating greater than 50% under win/lose outcomes. The burden of proof of course falls upon the party seeking to enforce IP rights.

A study conducted in the US of patent validity cases that ran to final judgment in the period 1989-1996 found that about 54% of all litigated patents were held valid.¹⁸⁰ The study found that very few software, biotechnology and pharmaceutical patents were litigated to final judgment in the review period, and that well over a decade elapsed between filing a patent application and the Court ruling on validity. It is not clear what conclusions can be drawn from such a study, other than that parties' advisers do not seem to have a significant capacity to predict the outcome. It is difficult to assess the cases in which an issued patent was held invalid without subjecting all the evidence before the Court to independent objective assessment to form a view whether the error was made by the Patent Office or the Court.

It may be desirable to conduct a study of the decision record of the Australian courts which would involve an investigation of the outcome of every reported decision in which the validity

¹⁷⁸ ACIP, March 1999.

¹⁷⁹ ACIP *Review of Enforcement of Industrial Property Rights*, Attachment 2.

¹⁸⁰ John Allison and Mark Lemley, "Empirical Evidence on the Validity of Litigated Patents", *AIPLA Quarterly Journal*, 1998, Vol 26, No 3, p 187.

or the infringement of a patent was at issue. In any event, the surveys conducted by ACIP provide the best available information to date.¹⁸¹

One submission suggested that the IP system in Australia has been downgraded because the Courts give too little protection to the owners of IP rights.¹⁸² The submission asserts that Australian business is shying away from using the IP system because of the costs of protection, the uncertainty and lack of support from the Courts, and that this will adversely affect investment in R&D.

It is clear that patent law is a complex and specialised area of law overlaid on complex and specialised areas of science and technology.¹⁸³ Cost and complexity particularly impacts on small to medium enterprises.¹⁸⁴

The grant of IP protection may be regarded as essentially a policy question, having regard to competing interests of the inventor who claims to be eligible for the protection of the law, and rivals who would be free to practice the technology if eligibility criteria are not established.

It can be very difficult in such an area of law to assess whether the Courts are correctly applying the law, or whether in fact they are applying policy criteria and so making law every time they confront new facts and circumstances.

There is an increasing trend in many areas of law to question the effectiveness of using Courts to determine policy issues – partly driven by issues of cost and accessibility and partly driven by issues of certainty for parties who rely upon resolution of disputes through the Courts. For example, in the income tax area Courts determine assessability of income and allowability of deductions on the basis of "facts and circumstances" tests which derive from laws passed when trade and commerce was much more simple than it is today.¹⁸⁵ There is an increasing trend to acknowledge that functions which result in rights being created are not judicial, and may be properly conferred on administrative bodies which are not Courts and are not constrained by the practices and procedures of Courts.¹⁸⁶ It may, therefore, be worth reviewing the problems envisaged by IPAC when it considered the possibility of conferring functions on non-judicial tribunals.¹⁸⁷

¹⁸¹ ACIP *Review of Enforcement of Industrial Property Rights*, Attachment 1.

¹⁸² Submission of McDonald & Associates, Solicitors.

¹⁸³ ACIP *Review of Enforcement of Industrial Property Rights*, Attachment 2.

¹⁸⁴ ACIP *Review of Enforcement of Industrial Property Rights*, p 5.

¹⁸⁵ Review of Business Taxation, Discussion Paper 2, Volume 1, *A Platform for Consultation*, p 37.

¹⁸⁶ See *Attorney-General of the Commonwealth v Breckler* [1999] HCA 28, paras 38 and 41, citing *R v Trade Practices Tribunal; Ex parte Tasmanian Breweries Pty Ltd*.

¹⁸⁷ ACIP *Review of Enforcement of Industrial Property Rights*, p 10.

The Working Group endorses the following propositions put forward by ACIP:¹⁸⁸

- an effective IP system must provide for effective enforcement;
- testing of rights should be fast, cheap and predictable – independent of the financial strengths of the parties ("deep pockets");
- ineffective enforcement mechanisms will discourage use of the IP system.

ACIP noted that enterprises may prefer to use IP protection in the form of trade secrets rather than undertake the disclosures necessary to obtain patent protection and expose themselves to risks of patents ultimately being held invalid and unenforceable.¹⁸⁹ The cost to Australia would be the loss of technology diffusion that might otherwise occur through the patent system.

The ACIP paper did not, however, recommend any substantive change to the role of the Courts in the pivotal area of determining whether the protection of the law should be made available to an applicant, that is, patent validity. In cases of innovative technology having a high value, it may be assumed that this issue will be fought out in the Courts. The recommendations of the ACIP report appear to be intended to streamline this ultimate process, and are supported by the Working Group.

ACIP noted that enforcement overseas can also be costly, and in this regard there are a number of management strategies that owners of IP rights can take to reduce the risks of enforcement.¹⁹⁰ It is well known that a victory in Court can be a costly process – the full costs of which, both in management time and legal costs, will not be recovered.

Possible initiatives

- Implement the recommendations in the ACIP report *Review of Enforcement of Industrial Property Rights*, including:
 - Amend the Patents Act to follow the UK legislation which permits a wider ambit of claims being supported by and gaining priority from the provisional specification.¹⁹¹
- Enterprises should develop best practice risk management strategies to assist them deal with validity and enforcement issues.

5.2 Lack of specialist courts for patent enforcement

Issues

¹⁸⁸ ACIP *Review of Enforcement of Industrial Property Rights*, p 6.

¹⁸⁹ ACIP *Review of Enforcement of Industrial Property Rights*, p 7.

¹⁹⁰ ACIP *Review of Enforcement of Industrial Property Rights*, p 8.

¹⁹¹ ACIP *Review of Enforcement of Industrial Property Rights*, pp 17-18.

Should a separate court dealing with patents be introduced?

Discussion

The same courts are responsible for enforcing antitrust laws against IP "monopolies". There may be a perception that among judges dealing with IP matters the lack of sufficient expertise. Solutions to these problems include the creation of a specialist court to deal with IP related matters, which has been successfully introduced overseas.

To place the Australian system in context it may be desirable to conduct an analysis of other countries' court systems to determine the effect of court structure upon patent decisions. Specific approaches to this topic include:

- (a) a study of patent enforcement decisions in the United Kingdom before and after a separate court dealing with patents was introduced; and
- (b) a similar study of enforcement decisions in the United States before and after a patents appeal court was introduced.

Despite the possible benefit of further studies, the Working Group endorses the recommendations of ACIP for greater specialisation in the Courts dealing in IP matters.¹⁹²

Possible establishment of a separate, specialist Court, would require further consideration, in the light of the experience in the UK with the Patents County Court. Arguably the more positive outcome of that initiative was that the High Court in the UK was caused to reform its procedures and appoint specialist judges. The ACIP proposals are of the latter kind.

Possible initiatives

- Confer exclusive jurisdiction in patent matters in the Federal Court.
- Promote further specialisation of judges in IP matters.

5.3 Defence of challenging validity

Issues

Is there a sufficient presumption of validity?

Discussion

It is often the case that action for enforcement of a patent is immediately met with an action for revocation. This results in expensive court action, thereby limiting the ability of small to medium businesses to defend their IP. Solutions to these problems include the creation of an effective presumption of validity.

In Australia there is provision for pre-grant opposition and a presumption of validity. While most patent disputes are handled at the pre-grant opposition stage, the Patent Office must

¹⁹² ACIP *Review of Enforcement of Industrial Property Rights*, pp 18-20.

give the benefit of the doubt to the patent applicant, so opponents sometimes prefer to wait until the patent is granted and then seek revocation in the Courts.¹⁹³

The policy question of the desirable point in time to decide between the competing interests of the inventor who claims to be eligible for the protection of the law, and rivals who would be free to practice the technology if eligibility criteria are not established, is almost insoluble. Opponents cannot be expected to know about the application until commercial conflicts occur in the market place. Yet the inventor and licensees need a sound basis to make the necessary investment. While ACIP supported post-grant opposition, this was not supported by industry groups.¹⁹⁴

Possible initiatives

- Implement the recommendations in the ACIP report *Review of Enforcement of Industrial Property Rights*, including:
 - The benefit of the doubt in substantive examination by IP Australia ought to be removed, and the presumption of validity heightened, to ensure that validity will in most cases be tested at the time of grant.¹⁹⁵

¹⁹³ Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p 34.

¹⁹⁴ ACIP *Review of Enforcement of Industrial Property Rights*, p 24.

¹⁹⁵ ACIP *Review of Enforcement of Industrial Property Rights*, pp 15-16.

6. RECOMMENDATIONS OF THE WORKING GROUP

There have been numerous reports on R&D, technology uptake, higher education research and other aspects of the innovation system over the last 10 years. It is clear that a strong system for the protection for IP is essential to foster innovation.

The Working Group accepts submissions made to it that applied research which is driven by commercial rather than academic or bureaucratic priorities is essential to foster innovation, and that Government should support pure research through public research institutions, but both kinds of research need to be supported by Government to provide spillover benefits to society which market forces would otherwise fail to deliver.

The Working Group also accepts submissions that competitive markets force firms to innovate more rapidly. Competition is built on the diffusion of information, so networking, collaboration and linkages are essential to create "critical mass" to facilitate exploitation of commercial opportunities.

The key impediments to innovation identified by the Working Group derive from our culture, which tends not to acknowledge or reward adequately innovation and risk-taking. The Working Group believes that the responsibility for managing change lies with organisations and that all Government can do is ensure that education and training promote a risk-taking culture.

The Working Group has focussed on policy intervention by Government – which will require coordination across Federal and State departments with responsibility for different IP areas. The recommendations below are of a general nature – the Working Group does not wish to pre-empt discussion of possible initiatives – and will need sharpening to identify specific actions and responsibilities moving forward.

Accordingly, the Working Group recommends the following for consideration and discussion:

1. Streamline administrative responsibility for IP policy and the process of policy response to emerging technologies and emerging problems with the IP system, including:
 - Establish an IP research centre, funded by Government and/or industry, possibly through the auspices of IP Australia, to provide independent multi-disciplinary input into IP policy formulation. Such a body could:
 - examine industry sectors with low R&D intensity, particularly those with export potential, to see where measures to increase R&D intensity and to more effectively manage IP would best be targeted;
 - develop a prioritised list of currently pending reform issues, such as enforcement processes and costs of enforcement, coverage of emerging technologies by existing IP rights;
 - conduct a study of the decision record of the Australian courts which would involve an investigation of the outcome of every reported

decision in which the validity or the infringement of a patent was at issue.

- Conduct a study of IP protection and service provider costs and the effectiveness of Government programs to cover any perceived funding gap.
 - Ensure effective input from users of the IP system.
 - Establish a coordinating body or mechanism to liaise between Government departments with responsibility for different areas of IP and ensure that IP policy is coordinated and given higher priority.
 - Establish a "single entry point" website to coordinate enquiries concerning IP falling under different portfolio responsibilities.
 - Reduce the lead time for effecting change in the IP system, for example by giving higher priority to IP legislation.
2. Streamline the process of drafting of IP legislation to implement law reforms that will keep Australian IP laws competitive with leading trading nations. We must reduce the lead time for effecting change in IP legislation. In particular, there are a number of developments that require legislative implementation:
- Follow through with replacing the petty patent system with the "innovation patent", involving a lower threshold of inventiveness.
 - Follow through with announced plans to update the *Designs Act* to provide clearer definitions, stricter eligibility and infringement tests, a more streamlined registration system, and better enforcement and dispute resolution procedures.
 - Progress the *Copyright Amendment (Digital Agenda) Bill 1999* through industry consultation to address the challenges for copyright protection posed by new communications technologies, particularly the Internet.
 - Consider amending the *Patents Act* to provide a "grace period" as in the US to the effect that early publication is not fatal to patentability provided the application is lodged within a specified period (which would require multilateral implementation).
 - Consider amending the Patents Act to provide for extension of patent terms based on justification on evidence of regulatory processes reducing effective patent life (which requires careful balancing of competing interests).
 - Consider strengthening Australian regulatory legislation if necessary to protect commercial-in-confidence information submitted by enterprises to Government authorities when registering products in Australia.

- Implement the recommendations in the Advisory Council on Industrial Property (ACIP) report *Review of Enforcement of Industrial Property Rights*, including:
 - Amend the Patents Act to follow the UK legislation which permits a wider ambit of claims being supported by and gaining priority from the provisional specification.
 - Confer jurisdiction in patent matters in the Federal Court and/or Federal magistracy.
 - Promote further specialisation of judges in IP matters.
 - The benefit of the doubt in substantive examination by IP Australia ought to be removed, and the presumption of validity heightened, to ensure that validity will in most cases be tested at the time of grant.
- 3. Encourage all trading partners to implement the minimum requirements of the WTO TRIPS Agreement and support countries in Australia's region to develop their IP systems.
- 4. Support amending the Trade Practices Act in accordance with recent recommendations of the National Competition Council to extend the current IP exemption to all relevant kinds of IP to provide certainty for owners and licensees wishing to invest in innovation and exploit exclusive rights attaching to IP, and consider:
 - reviewing the ACCC/NCC interpretation of the IP exemption to determine whether, having regard to the likelihood of it being upheld by a Court, legislative amendment is desirable to provide certainty for enterprises wishing to invest in innovation as owners and licensees of IP.
- 5. Review amendments to the tax laws along the lines recently proposed in the UK (on a revenue neutral basis) concerning deductions for R&D expenses and writing off capital costs to ensure neutral treatment across different kinds of IP rights and for tax loss companies and public research institutions to facilitate unlocking their IP.
- 6. Enhance public funding of R&D to provide encouragement and funding for:
 - The provision of affordable skilled services of valuers, patent attorneys and lawyers for public research institutions and small to medium enterprises in protecting and commercialising IP, on a success or deferred fee basis.
 - Early stage IP protection costs.
- 7. Identify means to develop and promulgate sector-specific best practice approaches to management of IP and corporate governance, including:
 - Commercially evaluating IP at an appropriate stage of the development cycle to assist identify the path to market.

- Deciding on timing of publication and IP protection.
 - Promotion and commercialisation of publicly funded IP.
 - Increasing linkages between public research institutions and industry and commerce, including through Cooperative Research Centres and spin-off companies.
 - Increasing sharing of risks and rewards of commercialisation of IP between public research institutions and researchers by appropriate commercial arrangements on a case by case basis according to the technology and their circumstances, including equity in spin-off companies.
 - Creating critical mass for provision of management services through various kinds of networks and alliances.
 - Active management by industry and commerce of technology transfer from public research institutions.
 - Developing best practice risk management strategies to assist enterprises deal with validity and enforcement issues.
8. Continue to develop public awareness of the importance of IP and innovation (through Government providing appropriate incentives and support) including:
- Add IP content to science and technology programs for secondary school students.
 - Run training for researchers and technology managers in public research institutions and managers of small to medium enterprises in the strategic use of IP advisers in commercial negotiations and for risk management purposes – drawing on international expertise to ensure we achieve world best practice.
 - Run courses/information sessions for researchers and technology managers in public research institutions and managers of small to medium enterprises that focus on the specifics of IP regimes in our major trading partners.
 - Develop a public awareness campaign through providing public recognition for successful Australian innovations, in conjunction with the programs described in the above two points.

7. CASE STUDIES

BIOTA

Biota is an Australia biotechnology company engaged in the discovery of new human pharmaceuticals. By building on Australian science in virology and molecular biology, Biota is generating a portfolio of valuable IP relevant to the treatment of a number of human diseases.

Biota's core competency is its ability to identify promising Australian drug research projects particularly relating to respiratory viruses and cancer, and to bring them through the development clinical testing stages. It then generally forms partnership with multinational companies in bringing these products to commercialisation.

Its flagship investments to date is the anti-influenza drug Zanamirvir (Relenza™). Relenza™ achieved the significant milestone of FDA approval in July this year. Biota has joined a small group of companies worldwide which have brought biotechnology-derived medicines from research to commercialisation.

The Relenza™ success has been 20 years in the making. Scientists at the CSIRO and the Australian National University had been working on the flu virus since the 1970s and it wasn't until the '80s that Biota became involved. Biota saw the potential of the research, raised funds to finance further work and went public in 1985.

Biota established a medicinal chemistry group at the Victorian College of Pharmacy, under the direction of Professor Mark von Itzstein, to synthesise molecules based on the CSIRO work. Biota owned the IP and took responsibility for the patent.

Relenza™ is the result of some remarkable science. The company and researchers established a solid IP base and then patented well. This meant the company started out with very good IP resources which gave it a strong base when it came to negotiating with overseas drug companies.

Biota recognised early in its commercialisation path that it did not have the resources, the skills or experience to take a product all the way through the commercial process, nor the market presence to do justice to Relenza™. It needed a strategic partner to capture the product's market potential.

Biota reached an agreement in late 1989 with the British pharmaceutical house, Glaxo Wellcome, which has expertise in drugs delivered by inhalation. Under the terms of the licence, Glaxo took responsibility for developing and marketing Relenza™ while Biota will receive a royalty on world sales.

Analysts' predictions for peak sales of the influenza drug are in the range of A\$500m to \$1 billion 4-5 years after FDA approval. The US, Europe and Japan represent 85% of potential pharmaceutical sales worldwide.

Under the final agreement with Glaxo Wellcome, Biota will receive a royalty rate of 10% of Relenza™ sales in Australia, New Zealand, Indonesia and South Africa and 7% of net sales in the rest of the world. Biota's royalty income is forecast to be more than A\$70m.

Biota charges research and development costs, including patent costs, to expense as incurred. No amount was carried in Biota's in its financial statements as at 30 June 1999 in respect of intangible assets.

The deal with Glaxo Wellcome has created other opportunities for Biota. Its success has brought the expertise of Australian biotechnology to the attention of other pharmaceutical companies and Biota anticipates finding a partner for developing further drugs will be easier.

Biota learned a lot about protecting IP through the project and working with Glaxo Wellcome. Glaxo's patenting approach is different from many biotechnology companies in that they file for patents later rather than earlier. This can be risky, but it means they have the necessary data to support and defend their patent claims. In the long run it means better and more commercially focussed protection of the IP, as the company must anticipate possibilities for competitors to "invent around" the patent.

Relenza™ is currently the only approved drug for treating influenza A and B anywhere in the world, but other companies are vying to get into the influenza market. Competition is a reality in developing new classes of pharmaceutical products.

Biota considers it is very important to maintain secrecy until a patent application is ready to file. However, research institutions are driven by the desire to publish. Biota's success to date has helped demonstrate that it's worth waiting to secure IP before publishing. Further, by that time the researchers have something really worth publishing, and can use it to strategically market the technology. Biota's publication strategy is closely linked to its commercialisation strategy. When hiring new research staff Biota looks for people who have some patenting experience. This demonstrates inventiveness as well as commercial experience in IP matters.

Part of Biota's 5 year plan is to develop optimal organisational structures for driving speed of innovation, knowledge management and decision making. The key to success is to develop novel ideas and then test them rapidly and comprehensively. Biota's business model is to add value with projects through Phase I/II clinical trials to show proof of principle before attempting to licence out projects. This will require aggressive pursuit of IP and leveraging alliances and networks.

A rapid diagnostic test for the influenza virus at the point of care is a natural partner for Relenza™. Rather than sending the company down the path of become a diagnostics manufacturers, Biota searched the world for a suitable partner and located BioStar, then a small private company based in Boulder, Colorado. In seeking a partner, Biota's philosophy was not one of seeking to maximise its immediate returns, but to find a company with the expertise and motivation to push the development through to the market.

Under the agreement reached with BioStar, Biota undertook some development of the diagnostic and oversaw the work in Colorado. Both companies will share the profits from the sale of the product emerging from this activity in the USA, while BioStar will receive royalties for sales made in Europe. Manufacturing for the world market is carried out in Colorado and the diagnostic kit first went on sale in the USA in December 1998, in time for the north hemisphere influenza season.

The expertise developed in the influenza project is now being leveraged by Biota to develop therapies for the common cold. With the support of an AusIndustry R&D Start Grant of A\$3.2m, Biota's team of researchers are synthesising compounds which will be tested at Biota's laboratory on the Monash University campus.

Source: Biota Holdings Ltd 1999 Annual Report, Ernst & Young, "Australian Biotechnology Report 1999", October 1999, p 39 and IP Australia information.

RECALDENT

Bonlac Foods Ltd, Australia's leading dairy company and one of its biggest food exporters, recently launched a new, patented product that promotes remineralization of tooth enamel.

The product is a complex of casein phosphopeptides and amorphous calcium phosphate (CPP-ACP) derived from milk, and is trade marked "Recaldent".

CPP-ACP has been researched actively by the University of Melbourne since the early 1980s. Professor Eric Reynolds and researchers from the School of Dental Science discovered through studies on laboratory animals that the effects of demineralisation, which is the first stage of tooth decay, could be reversed by CPP-ACP.

Casein is a protein that occurs naturally in milk in association with calcium phosphate. Through research supported by the Victorian Dairy Industry Authority, the researchers discovered a way of keeping calcium and phosphate in a soluble amorphous state (ACP) using phosphopeptides derived from casein. This invention, and developments of it, has been protected by a number of patents owned by the University of Melbourne and the Victorian Dairy Industry Authority.

Early attempts at technology transfer arrangements with a toothpaste manufacturer, prior to clinical trials, were unsuccessful due to the lack of commercially available quantities of CPP-ACP.

Bonlac first became involved as a commercial partner in 1995, bringing its know-how as a manufacturer of milk products to the task of scaling up production of CPP-ACP. Development of the necessary manufacturing know-how to manufacture the product at commercial rates required a substantial investment of resources.

The University and Bonlac recognised that effective marketing through brand development and recognition would be a key commercial driver of the revenue stream from commercialisation, and that participation by the School of Dental Science in clinical trials and further research with an end-user would generate ongoing research funding.

The parties accordingly re-negotiated aspects of the initial marketing arrangements to provide Bonlac a solid platform for commercialisation, through exclusive rights to manufacture and market CPP-ACP.

Bonlac undertook substantial market research studies in the United States, Europe and Japan to develop and register the trade mark "Recaldent" worldwide, and develop the marketing approach.

Bonlac carries brands in its financial statements at cost. Carrying values in aggregate exceed recoverable amounts determined on a net present value basis, so no amortisation is charged. Patent costs are amortised over 5 years. Research and development costs are expensed as incurred.

Bonlac identified Warner-Lambert, a major producer of sugarless chewing gum, as the commercial partner to launch Recaldent™, granting Warner-Lambert exclusive rights to use Recaldent™ in chewing gum products.

Warner-Lambert has worked with the School of Dental Science to undertake further scientific and clinical studies to demonstrate the effectiveness of sugarless gum with Recaldent™ in strengthening teeth by remineralizing tooth enamel.

In early 1999 the United States Food and Drug Administration accepted notification of Recaldent™ as "Generally Accepted as Safe".

Recaldent™ has been launched as an ingredient of Warner-Lambert's "Trident Advantage" and "Trident for Kids" chewing gums in October 1999.

Further research and development, including clinical trials, is continuing, and the addition of Recaldent™ to other oral care products and the use of CPP-ACP technology in other applications are expected to follow in the coming years.

Source: Bonlac Foods Ltd 1999 Annual Report and published data.

COCHLEAR

Cochlear was founded in 1981 and has maintained its position as an international leader in the design, manufacture and sale of cochlear implant systems.

The company's Nucleus 22 and Nucleus 24 implant systems enable hearing impaired people to perceived most environmental sounds and speech. The technology involves an implant that stimulates sound in the cochlea by electronically stimulating the auditory nerve. A set of elements is worn externally – a microphone, cable and transmitting coil, and a speech processor.

The number of implant recipients worldwide is approaching 25,000. The company's distribution and service network spans more than 50 countries.

The corporate office, manufacturing facilities, principal research and development facilities are in Sydney.

Sales revenue for the year ended 30 June 1999 was \$127M. Research and development expenditure was about 11% of sales revenue. This expenditure is expensed as incurred.

Competition remained strong during the year, with the company holding an estimated 65-70% of the global market.

During the year the Nucleus 24 was launched in Japan, and clinical research was reported on the company's Custom Sound technology. Custom Sound will enable individuals to optimise hearing potential – it is not possible to predict the individual's requirements until after implantation.

The first research implant was switched on in 1978. It was developed over a 10 year period by a team from the University of Melbourne led by Dr Graeme Clarke. The first patent was applied for on 25 October 1978.

Cochlear, together with the University of Melbourne, with support from the Australian Government, developed the more advanced 22 channel implant, which was first implanted in 1982.

The University and the Commonwealth hold patents covering early research which was licensed to Cochlear. The University and the Commonwealth have earned over \$8M in royalties from their IP.

Through continuing research and development the company has achieved consistent enhancements in both the system performance and cosmetic appeal. Cochlear has over 180 patents in 7 countries protecting key features of the implant.

The company notes a contingent liability arising from allegations raised in 1992 that it has infringed a third party's patent rights, and states its belief based on legal advice that it has a good defence to the allegations.

Source: Cochlear Ltd 1999 Annual Report and IP Australia information.

ADVANCED CERAMICS DEVELOPMENT

UniQuest Pty Ltd is a wholly-owned subsidiary of the University of Queensland, founded in 1984 to provide expertise and advice on IP protection and the commercialisation of the products of research, and facilitate interactions between the University and commerce, industry, government and community groups. One of its major functions is to develop and manage early-stage ventures.

Increasingly, start-ups are emerging as the commercialisation pathway for research technologies. For the past three years UniQuest has been incubating a major new organisation, Advanced Ceramics Development (ACD), to provide product development, applied research, and scale-up support for commercial ventures in the field of advanced ceramics and to exploit the commercial potential of the University's IP in this field. UniQuest's first seed investment in ACD was \$1 million in 1994 and since that time the business has generated \$6 million in revenues and has 7 new products in development, protected by 12 patents.

ACD is currently a division of UniQuest and is held as a 'virtual' company to provide the nurturing and migration of key business skills necessary to allow for maximum growth opportunity. ACD is to be spun off as a corporate entity in December 1999.

UniQuest's strategy for ACD, is to exploit the commercial potential of major, generic discoveries and developments across several families of advanced ceramics materials, through creating ventures in specific fields aimed at the global marketplace: functional ceramics; modified clays; and catalysts.

ACD has multiple products, processes and technologies with high commercial potential in each of these fields. Its research, product development and scale-up programmes are designed so that advances in one field support and complement advances in the other two.

The UniQuest/ACD commercialisation strategy is to form start-up and joint venture companies in specific technology/product/market clusters and for these companies to be supported by ACD, under contract, for further R&D, product development and scale-up work. In this way, the core group of technical research personnel can be managed to generate new growth opportunities at a central location, whilst commercialisation of the various technologies with industry can proceed unencumbered.

Progress in research, product development, scale-up and commercialisation is accelerating rapidly in each of the three fields:

- (a) Functional ceramics - ACD has been producing the world's highest quality HTS superconductor powders (a functional ceramic) and selling these powders world-wide, since 1995. A joint venture was signed with a Japanese company, Enya Systems, in 1996 to bring an automated production facility for these powders to the marketplace. UniQuest has proved a vital role in managing and coordinating the activities of these disparate groups, in Japan and Australia, by leveraging excellent third-party business contacts in Japan to provide translation and facilitation services.
- (b) Modified clays - a start-up company, Mine Remediation Services Pty Ltd (MRS) was established in 1996 to exploit the commercial potential of KAD, a modified clay developed by ACD, in cleaning up mine tailing ponds. A major pilot plant to produce KAD in pre-commercial quantities was commissioned in April 1997. A deal to bring a second stage investment into MRS was completed in May 1997.

- (c) Catalysts - an R&D, product development, scale-up and commercialisation team has been working on ACD's catalyst program since 1995. Catalysts using modified clay and functional ceramics materials have been developed, with applications in environmental management, chemical and petroleum industries. A commercial agreement has been completed with a subsidiary of ICI to implement a production-version nitric acid catalyst and then exploit the global market for this product. Two state-of-the-art industry-standard catalyst test rigs have been constructed with one undergoing commissioning and one now performing industrial trials prior to commercial scale up.

Source: Information provided by UniQuest.

MEMTEC

US Filter Corporation acquired Memtec Limited in January 1998, acquiring the Memcor patented Continuous Microfiltration (CMF) technology.

The company designs and develops speciality filtration products which, essentially, are flexible, fine pored sponge-like structures - sheets and tubes - made of chemically and physically modified nylons and other polymers. The sponge-like nature of the membrane surface ensures a three dimensional surface and it's this large surface area at the interface of the fluid being treated which reduces the amount of pressure and air needed to clean the filters and which has made Memtec technology so successful.

It's a technology of great importance worldwide. The growing scarcity of fresh water, alone, in some parts of the world is creating a strong demand for filtration equipment. Added to this are more stringent water standards, particularly in Europe and the US.

The Memcor CMF technology originated from work undertaken at the University of New South Wales, and was developed and commercialised at the company's facilities at Windsor, New South Wales, with funding assistance from Federal Government R&D grants.

The company's strategy has been to develop the science of tailored membrane separation, patent the developments where possible and then exploit its patents by manufacturing and marketing the products or, where market forces dictate, by technology agreements or joint ventures.

CMF is now installed in over 30 countries world wide on drinking water applications, with over 100 installations on surface and groundwater supplies to specifically remove Giardia Lamblia cysts and Cryptosporidium Parvum Oocysts.

The manufacturing and R&D facilities at Windsor cover 20 acres and employ 200 people.

The company has some 1000 patents and 600 trademarks registered and pending. Five research locations around the world are regularly producing new inventions, each one requiring as many as 30 patents around the world. As well, a marketing division is continually creating new words and symbols all of which must be protected.

Protecting its patents, however, has not been without difficulty and the company went through a steep learning curve. The company hired a former patent examiner with IP Australia and a great deal of practical experience in the management and protection of IP to look after all the company's IP.

The company decided not to leave their IP protection to outsiders, considering it's best looked after by someone who understands and is committed to the company's objectives. Effective IP protection involved educating the company's staff in IP matters. Managing and defending IP is a complex and very time consuming business. Gathering information, instructing lawyers, attending meetings, reviewing correspondence and travel - just getting to the first court hearing stage can take years. In the meantime, the business can suffer.

The company's decision to employ a specialist IP manager to look after all this left the executives free to get on with running the business.

To be effective in global markets, the company must know the IP system, which varies from country to country, and know how to work it to advantage. It's vitally important to be thorough and to get things right at the early stages so that if or when problems arise in the future, the company is in a position to enforce its rights.

According to the company, enforcement is very costly, and Australia is one of the most expensive countries in the world when it comes to enforcing IP rights. However, the company considers that a company which isn't prepared to defend its rights should not bother about obtaining IP protection in the first place.

Source: US Filter Corporation 1998 Annual Report, and IP Australia information.

CRCERT

The Cooperative Research Centre for Eye Research and Technology (CRCERT) is a collaborative venture between the University of New South Wales, CSIRO Division of Molecular Science, the University of Western Sydney, the Victorian College of Optometry, the Optometric Vision Research Foundation and Queensland University of Technology. Professor Brien Holden is the Chief Executive of CRCERT

The first highly oxygen permeable soft contact lens designed for 30 days and nights of continuous wear, the Focus Night and Day™ extended wear lens, has now been launched by Ciba Vision in Australia, Europe and Mexico.

It was developed by CRCERT through collaborative research with Ciba Vision. Royalties from product sales are expected next year.

The number of contact lens wearers worldwide has increased from 25 million in 1986 to 85 million today.

As part of the contact lens trials, CRCERT developed clinical trials database methodology that significantly streamline the process, which has now been used in six clinical studies in the last year.

CRCERT is establishing an IP holding company, and a new database to track and manage IP, invention disclosure statements and patent applications.

All staff recently received training from patent attorneys on IP protection issues.

The Commercialisation Committee identifies commercial opportunities and maintains the IP portfolio. The Committee deals with CRCERT's commercial participants regarding patent protection and commercialisation licensing.

CRCERT maintains cooperative linkages with commercial participants for research and product specific commercialisation arrangements.

Novel polymers and surface technologies developed in the extended wear contact lens project have strong potential for biomedical exploitation outside the ophthalmic field. Negotiations for licensing the technology to a spin-off company, BioCure, are well advanced. This company has been established in the US with a wholly owned Australian subsidiary, Pacific Biomaterials Pty Ltd.

Source: CRCERT 1999 Annual Report

RESMED

ResMed Inc is a leading innovator, manufacturer and marketer of respiratory products for the home healthcare market, specialising in the treatment of sleep disordered breathing (SDB).

ResMed Inc was established (as ResCare) in 1989 to commercialise a device for treating obstructive sleep apnea (OSA), a major subset of SDB.

People with OSA experience recurrent episodes where respiratory airflow ceases during sleep when the muscles which normally keep the upper airway open relax and cause the airway to narrow during sleep.

The technology for nasal continuous positive airway pressure (CPAP) was invented in 1980 by Professor Colin Sullivan and researchers at the University of Sydney. CPAP provided the first successful non-invasive treatment of OSA.

CPAP systems deliver air pressure through a small nasal mask. The pressure keeps the upper airway open. CPAP is not a cure, but a non-invasive therapy. It must be used on a nightly basis.

ResMed also designs and manufactures products and accessories for the delivery of non-invasive positive pressure ventilation; again a field of respiratory medicine pioneered by Professor Sullivan and his colleagues through the 1980s.

OSA affects approximately 20 million Americans, its prevalence being comparable to asthma or diabetes. However, awareness is low with only around 5% of sufferers being diagnosed and treated.

ResMed is committed to technological innovation. Since its founding ResMed has consistently committed approximately 8% of earnings to R&D.

The innovation process occurs through the engagement of in-house engineers, designers and clinical staff. Furthermore ResMed has a Medical Advisory Board consisting of physicians and scientists specializing in the field of sleep disorders. The Medical Advisory Board meet with ResMed senior management and members of its research and marketing groups to advise on technology trends and other developments in sleep disordered medicine. ResMed also sponsors research conducted at leading research institutions throughout the world to identify trends in the treatment of sleep disordered breathing.

Common to all treatment methods and apparatus offered by ResMed is the patient/machine interface, i.e. the nasal and face masks. There has been considerable development in mask design philosophy since the early work undertaken by Professor Sullivan. ResMed's technical mastery of design and manufacturing processes is well illustrated by the medical benefits (e.g. patient compliance) achieved with ResMed masks. Success in this field is measurable in commercial results: ResMed supplies its masks to industry competitors as OEM product.

Parallel with mask development has been refinement of the flow generator and accessories i.e. the source and circuit for air supply to the patient via the mask. In this regard, ResMed has led the world in devising compact, portable and quiet flow generators and has gone further in developing automatic diagnostic and treatment systems suitable for use within both clinics and patients' homes. All of these developments have involved ongoing innovation – in terms of the outward appearance of

the product, performance specifications that meet patient and clinical requirements, engineering for reliability and cost effective manufacture.

There is now a recognized association between sleep disordered breathing and common diseases such as chronic obstructive pulmonary disease, stroke and cardiac disease. ResMed is working to explore these opportunities.

ResMed believes that continuous product development and innovation will be key factors in its ongoing success. In October 1999, ResMed appointed Dr Bob Frater as VP Innovation (formerly Deputy Chief Executive of CSIRO) with responsibility for enhancing the path to market for new products.

Interest at the highest level is essential for an organization to fully embrace the commitment required to pursue the growth of a meaningful intellectual property portfolio. ResMed's Chairman and Board have always been conscious of the important role played by intellectual property in achieving recognition for the effort and money spent on R&D.

Integration of intellectual property into ResMed's commercial strategy is not limited to the team responsible for intellectual property management; all innovators, including engineers, designers, clinical educators and marketers make vital contributions to the protection of ResMed's intellectual property.

In the 10 years since its founding, ResMed has invented a large number of improvements and innovations by addressing the needs of patients and specialists around the world. The investment in continual R&D has been rewarded by positioning ResMed as one of the two world leaders in its field.

It has been ResMed's experience that it must continue to seek intellectual property protection and not rely on the existence of one patent. Accordingly ResMed holds granted intellectual property rights applying across its product range. ResMed also believes that an export orientated Australian manufacturer must consider seeking intellectual property protection in overseas markets.

The company relies on a combination of patents, design registrations, copyright and proprietary know-how to protect its technology. The R&D commitment is also reflected in the growing intellectual property portfolio of patents, design registrations and trademarks. At June 1999 ResMed held 186 granted or pending patents and designs. While ResMed owns the vast majority of its intellectual property it has also licensed patents from the University of Sydney in exchange for paying a royalty. ResMed has granted US competitors patent license rights and assumed OEM supplier status for patented products.

Each of ResMed's products, including its range of CPAP systems, variable positive airway pressure (VPAP) systems, AutoSet systems, masks and accessories, is sold under a distinctive trade mark.

The company's financial statements filed with the SEC indicate that research and development costs are expensed as incurred. The company does not value intangible assets in its books or the notes to its accounts (except for patent registration costs which are capitalised and amortised over the estimated useful life of the patent, generally five years).

The VPAP system, under which a higher pressure is delivered when the patient breathes in and a lower pressure when the patient breathes out, was developed with assistance from a \$2.6M START grant to ResMed Ltd, a wholly owned subsidiary of ResMed Inc.

Today, ResMed products are marketed in over 40 countries using a network of independent distributors and ResMed's direct sales force located in Australia, USA, UK, Germany, France, Singapore, Malaysia and New Zealand. The marketing approach is tailored to each national market, based on regional awareness of sleep disordered breathing as a health problem, physician referral patterns, consumer preferences and local health care reimbursement policies. Principal R&D and manufacturing operations are situated in a purpose built facility Sydney, Australia.

ResMed is cashflow positive with no debt. Revenues and profits have increased steadily over its first 10 years. Today, ResMed operates through offices in the United States, Australia and through a network in 35 other countries. ResMed is the fastest growing major company operating in SDB and is currently ranked number two globally.

ResMed Inc listed on NASDAQ in 1995, raising US\$24M. In September 1999 its stock was listed on the NYSE. In November 1999 ResMed assumed dual listing on both NYSE and ASX.

In March 1998 the company granted a third party licences to manufacture products using the company's patented technology for the US homecare market.

In February 1999 ResMed purchased a minority equity in Flaga hf, an Icelandic manufacturer of sleep diagnostic equipment, which ResMed will distribute in the US and selected other countries.

In June 1999 ResMed formed a strategic alliance with Critical Care Concepts Inc to distribute selected ResMed products to the US hospital market.

In October 1999 the United States District Court made certain rulings in favour of a company, Respiroics Inc, against whom ResMed Ltd has brought a patent infringement lawsuit. The decisions do not affect the validity of the patents, and ResMed announced its intention to appeal. This litigation commenced in 1995 when ResMed commenced patent infringement proceedings against Respiroics in the US, and Respiroics countered by commencing proceedings against ResMed in the Federal Court of Australia alleging breaches of the Trade Practices Act.

The company notes in its annual report filed with the SEC that patent laws regarding the enforceability of patents vary from country to country, and there can be no assurance that patent issues will be uniformly resolved, or that local laws will provide the company with consistent rights and benefits.

The annual report also notes that the company operates in highly competitive markets in which major competitors have greater financial, research, manufacturing and marketing resources. The company believes that an important factor in gaining market acceptance and market share for new products is the timing of introduction and speed with which the company can develop products, complete clinical testing and regulatory clearance processes and supply commercial quantities of product to the market.

Source: Annual Report and published materials.

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9. SUBMISSIONS RECEIVED

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Mr Peter Higgs	Propagate Institute Pty Ltd
Mr Stan Jeffery	ATP Business Incubator Program
Mr Colin Melvin	Office of Commercial Services Queensland University of Technology
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