



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

**HOUSE OF
REPRESENTATIVES**

STANDING COMMITTEE ON SCIENCE AND INNOVATION

Reference: Business commitment to research and development in Australia

MONDAY, 24 MARCH 2003

CANBERRA

BY AUTHORITY OF THE HOUSE OF REPRESENTATIVES

INTERNET

The Proof and Official Hansard transcripts of Senate committee hearings, some House of Representatives committee hearings and some joint committee hearings are available on the Internet. Some House of Representatives committees and some joint committees make available only Official Hansard transcripts.

The Internet address is: **<http://www.aph.gov.au/hansard>**

To search the parliamentary database, go to: **<http://search.aph.gov.au>**

HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON SCIENCE AND INNOVATION

Monday, 24 March 2003

Members: Mr Nairn (*Chair*), Ms Corcoran, Mr Evans, Mr Forrest, Ms Grierson, Mr Hatton, Mr Lindsay, Mr Tony Smith, Mr Ticehurst and Dr Washer

Members in attendance: Ms Corcoran, Mr Evans, Ms Grierson, Mr Lindsay, Mr Nairn, Mr Ticehurst and Dr Washer

Terms of reference for the inquiry:

To inquire into and report on:

The international comparisons indicate that while the public sector in Australia supports R&D at an impressive level, business investment is less impressive.

With particular consideration of:

the R&D drivers in small and medium sized business;

the needs of fast-growing companies; and

the considerations by which major international corporations site R&D investment,

the committee seeks to address three questions.

What would be the economic benefit for Australia from a greater private sector investment in R&D?;

What are the impediments to business investment in R&D?; and

What steps need to be taken to better demonstrate to business the benefits of higher private sector investment in R&D?

WITNESSES

BRADLOW, Dr Hugh, Managing Director, Telstra Research Laboratories, Telstra	601
CLARK, Mr Robert Adrian, Supervisor, R&D Tax Concession, Holden Ltd	601
CLARKE, Mr James Bernard, Managing Director, Australia R&D, Nortel Networks Australia Pty Ltd	601
COOK, Dr David John, General Manager, Operations, Clay and Concrete Products Division, Boral Ltd	601
DANKESREITHER, Mr Brent, Manager, Product Concept Synthesis, Holden Ltd	601
JOHNSTON, Ms Jenny, Director, Corporate and Government Affairs, Bristol-Myers Squibb Pharmaceuticals.....	601
JOYCE, Ms Leanne, Manager, Corporate and Government Affairs, Telstra.....	601
KING, Dr Graeme William, Specialist, Regulation and Policy (South Asia), Nortel Networks Australia Pty Ltd	601
KING, Mr Warren Leslie, General Manager, Systems Solutions and Product Development, Raytheon Australia Pty Ltd.....	601
LYON, Ms Jennifer, Taxation Manager, GlaxoSmithKline	601
McGOVERN, Miss Catherine, Government Affairs Manager, GlaxoSmithKline.....	601
McMANUS, Mr Brendan, Executive Director and Board Member, NEC Australia Pty Ltd.....	601
MICHEL, Mr David Andrew, Head of Consulting, ACT and National Account Manager for Defence, Bovis Lend Lease.....	601
MITCHELL, Mr Neville John, Chief Financial Officer and Company Secretary, Cochlear Ltd	601
PULSFORD, Dr John Derrick, Research and Development Manager, Varian Australia Pty Ltd.....	601
WOOD, Dr Lincoln, Director, Engineering and Product Assurance, BAE SYSTEMS Australia.....	601

Committee met at 8.10 a.m.

BRADLOW, Dr Hugh, Managing Director, Telstra Research Laboratories, Telstra

CLARK, Mr Robert Adrian, Supervisor, R&D Tax Concession, Holden Ltd

CLARKE, Mr James Bernard, Managing Director, Australia R&D, Nortel Networks Australia Pty Ltd

COOK, Dr David John, General Manager, Operations, Clay and Concrete Products Division, Boral Ltd

DANKESREITHER, Mr Brent, Manager, Product Concept Synthesis, Holden Ltd

JOHNSTON, Ms Jenny, Director, Corporate and Government Affairs, Bristol-Myers Squibb Pharmaceuticals

JOYCE, Ms Leanne, Manager, Corporate and Government Affairs, Telstra

KING, Dr Graeme William, Specialist, Regulation and Policy (South Asia), Nortel Networks Australia Pty Ltd

KING, Mr Warren Leslie, General Manager, Systems Solutions and Product Development, Raytheon Australia Pty Ltd

LYON, Ms Jennifer, Taxation Manager, GlaxoSmithKline

McGOVERN, Miss Catherine, Government Affairs Manager, GlaxoSmithKline

McMANUS, Mr Brendan, Executive Director and Board Member, NEC Australia Pty Ltd

MICHEL, Mr David Andrew, Head of Consulting, ACT and National Account Manager for Defence, Bovis Lend Lease

MITCHELL, Mr Neville John, Chief Financial Officer and Company Secretary, Cochlear Ltd

PULSFORD, Dr John Derrick, Research and Development Manager, Varian Australia Pty Ltd

WOOD, Dr Lincoln, Director, Engineering and Product Assurance, BAE SYSTEMS Australia

CHAIR—Welcome. The Standing Committee on Science and Innovation has been conducting an inquiry into business investment in research and development for some months now. The inquiry was launched in July last year. We received 82 submissions from a range of business and industry peak bodies, individual companies, government departments and public research institutions. Public hearings have been conducted in Melbourne, Sydney and Canberra.

The committee has also held a series of private roundtable meetings with small and medium sized enterprises in Adelaide, Brisbane, Canberra and Melbourne. In reviewing the evidence, the committee came to the view that it would be useful to gather more evidence from large multinational corporations, either Australian owned corporations or Australian subsidiaries of foreign multinational corporations. This morning's roundtable is a result of that decision.

I understand that all of you have been given details of the way in which this meeting is being conducted. I would like each of the participants here today to start off with a quick three minutes addressing issues like what drives your research and development activity in Australia; the importance of government programs like the R&D tax concessions; the use you make of CRCs and other public sector research institutions, such as the CSIRO; and, generally, what you think of R&D policy settings in Australia. So, if you could keep your initial comments addressing those things to about three minutes or so, after that we will open it up for discussion.

I have spread the members of the committee around the table. We found in the previous roundtables that that helped the flow of discussion. While we have kept this meeting private, we are recording it in *Hansard*, so it will ultimately be on the public record. If there are any issues or information you would like to give to the committee but would not like to see published publicly, we could arrange to do that at the end of the roundtable. Alternatively, you can let me know during the discussion and we can follow it up afterwards. We have a good cross-section of people from around the country on this committee. We will not go into their backgrounds, but if any of you have done your homework on the members of the committee you would have seen that there are quite a broad range of backgrounds, many of them very much related to science areas. Leanne and Hugh, you are here representing Telstra. Would one of you like to open the batting?

Dr Bradlow—I understand that you would like a three-minute statement. Perhaps I could just preface my remarks with a couple of points about our business context. I think one of the things that are poorly understood is that Telstra is a service business. Our role is to assemble complex technology assets and to offer them as systems and services. Our role is not to actually develop the technologies themselves, which do require global economies of scale in order to be cost effective. The competitiveness of our business is determined by the underlying processes, which is where a considerable amount of our technology emphasis goes.

In terms of TRL itself—Telstra Research Laboratories, for those of you who are not familiar with the acronym—our mission is to deliver competitive advantage to Telstra by anticipating the impact of technological change both on future customer needs and on our infrastructure requirements. As such, our core skills do cover most of the technologies that relate to telecommunications, because one of the key processes we deliver is technology choice; the other skills we focus on are those that allow us to deliver improved processes for our customers.

The key success factors for us primarily are strategic alignment with Telstra's business direction, particularly in the one- to five-year time horizon; obviously the skills of our staff in terms of creating a world leading resource base; the effectiveness of our R&D process, which we benchmark internationally against all the leading telcos in the world; and the cost effectiveness of research delivery, which is about half the US or European norm.

In terms of the questions from this committee, let me comment that, as far as relationships with external research agencies go, certainly in the telecommunications industry, Telstra is the

leading supporter of external R&D in the industry. We do this through participation in CRCs. We have established our own centres of excellence at some universities. We do individual contracts with agencies such as CSIRO and universities according to requirements. And we support student fellowships, both at postgraduate and undergraduate level. Our prime purpose in doing that is, first, to enhance our own internal future oriented research efforts and, second, to complement skills where we do not necessarily have them in house—for example, in some of the biosciences when we are studying the impact of electromagnetic emissions.

On the CRCs specifically, our experience has been that they tend to complicate the contractual arrangements that we have with external research agencies through their multiparty nature, whereas we tend to prefer bilateral arrangements, and they also tend to be university or researcher led as opposed to industry led. In that sense, they do not meet the critical success factor of strategic alignment with Telstra's business.

In terms of government support for R&D, there are three significant inhibitors in our view. The first is the reduction of the tax concession from 150 per cent to 125 per cent. The recent law changes do not allow companies like Telstra to benefit from the increased 150 per cent R&D, because the way our R&D fluctuates makes it very unlikely that we will see that sort of growth in R&D that is subject to the 150 per cent concession. The second thing is that we are not eligible for the pre-seed funds, which we find somewhat frustrating, because commercialisation is an extremely high-risk activity, and the best way in which government can support industry is to reduce the risk of that activity. Thirdly, the taxation rules with regard to intellectual property, which value and tax the intellectual property at key points in the process, are somewhat unrealistic in that they expect corporations to shell out actual cash for intellectual property which is extremely high risk and which, if it yields any value at all, is likely to do so in a three- to five-year time scale.

CHAIR—Thank you, Dr Bradlow. We will come back to a couple of those points, particularly those that you made at the end, during the discussion. We move now to GlaxoSmithKline: is that Catherine or Jennifer?

Miss McGovern—Both of us. I am going to start just by saying that in our earlier evidence to the committee we ran through the main drivers for our investment in R&D in Australia, which are across a whole range of health and medical areas and clinical trials as well as manufacturing processes and chemical entities.

One of the things that drives our R&D here in Australia is obviously the quality of research, the quality of researchers and the innovation that is present in the market here. Equally there are cost and quality issues. Cost here is very positive; quality is phenomenal. One of our units that we have here, compared with units world wide, is actually beating all of the others on quality.

One of the main reasons we wanted to come back to the committee, however, concerns some work we have done since our earlier evidence on the R&D tax concession and how we believe it could be made more effective, not purely for the pharmaceutical industry—in fact, probably being more impactful in other industries by a long way. It is really designed just to increase the impact that that tax concession has on driving research without actually increasing the funds involved. I am going to let Jenny, who is our tax manager, talk about that.

Ms Lyon—As Catherine has said, this proposal is actually all about making the dollars that are currently spent on the R&D tax concession more effective and more impactful as they are received by companies and managed within those companies in terms of driving R&D expenditure. I think the key thing is that, by actually having an R&D tax concession, what we are trying to achieve is to motivate or influence companies down a particular path in terms of increasing their commitment to R&D in Australia. But in actual fact, it is not the companies that make those decisions; it is the people within those companies who make decisions about what will be spent on R&D in Australia. Already operating within most corporations in Australia are a series of internal incentives and drivers which govern companies' behaviours and decision making patterns. This proposal is all about trying to leverage the R&D tax concession so that we can actually fishtail into those already existing internal incentive mechanisms and make the concession a lot more meaningful to business managers.

What is happening at the moment is that we are putting funding into the R&D tax concession and it is reducing income tax expense of companies in Australia. The people who manage income tax expense are people like me—tax managers and finance directors. The hope is that, by decreasing tax expense, we will be able to communicate effectively with our R&D managers and business managers and tell them that doing R&D is actually a little bit cheaper than they think and what they see in their management accounts.

We actually have an indirect link there and it is quite dependent upon that effective communication. It does not take into account dysfunctional behaviours that can occur within companies and it does not take into account strange accounting practices that can happen within companies. What we are saying is that we are actually giving funding to corporate Australia; it should make sense to that company that they are receiving those dollars and that they should therefore be recognising internally that R&D is cheaper than it is. In actual fact, for accounting purposes, the R&D tax concession just goes to the tax expense line and most R&D managers never see the economic benefit in their R&D budgets. The proposal that we put together involves making the R&D concession more visible and more tangible to those R&D managers but without actually converting it into an R&D cash grant. The trick is to get it booked as accounting income, and recognised as income for accounting purposes, without actually making it a cash grant.

I could talk a lot of accounting nonsense to everybody, but essentially what it means is that the economic benefit of the concession would be recognised as income. There would be a grant or R&D entitlement or credit issued by AusIndustry which could be recognised as accounting income, but in actual fact those credits or entitlements would be offset against the company's tax bill. From the government's perspective, nothing would change, but it would be very significant, I believe, from an R&D manager's point of view, because, all of a sudden, instead of the tax manager getting a decrease in tax expense of \$300,000, he has actually got \$300,000 or a bit more in his R&D budget that he can manage and perhaps use to fund further R&D in Australia.

The proposal involves not impacting profit after tax, so there is no distortion in the company's results. What it does allow is the benefit of the concession to be allocated amongst various departments in the companies so it can be seen. I think that will be very important in terms of overseas investors looking into Australia. It will be very evident that if we spend \$4 million on an R&D project in Australia, the company is going to kick in, quite visibly, \$300,000 in cash to go towards that project rather than what we are seeing at the moment, which is, 'If we

do that project in Australia, there will be a reduction in tax expense.' Most scientists glaze over when you start talking about tax expense and accounting and stuff. I do not really think it means a lot to them. Our proposal is about making the dollars that are currently spent more visible and more meaningful to companies and investors in Australia. I think that is probably about it.

CHAIR—I now call Neville Mitchell from Cochlear.

Mr Mitchell—Perhaps a little bit about ourselves first: we are perhaps a bit different from most of the people here in that we are an Australian company—75 per cent owned by Australians, listed on the stock exchange—with a market capital of nearly \$2 billion, but about 97 per cent of our sales are overseas. We do all of our research in Australia, although we do have a facility in Antwerp with about 30 people working there. All of the manufacturing is also done in Australia. So it is slightly different in that we are based in Australia and sell and work overseas.

I guess the issues that drive our R&D decisions in Australia are the fact first of all that we are domiciled in Australia—and that is important—but probably more important is the co-location with manufacturing. We think it is very important that there is this transition between where the research is and where the manufacturing is. The access to researchers, both within the company and within our universities, is of a very high standard here, particularly in our hearing health field. The reputation of Australia from a manufacturing point of view is excellent, and certainly that is a good spot for us to be exporting from in the high-tech area. However, we are a rather small industry and that does present problems in terms of finding sufficient researchers to perform all the work. I will get to that in terms of what might be improved a little later.

Financially, obviously Australia is still quite low priced as a manufacturer, and that ties into the R&D, as mentioned earlier. The last factor which impacts us with R&D decisions is the R&D tax concession. When the 175 per cent was introduced, that significantly influenced decisions last year in our R&D spend. We spent approximately \$5 million of extra R&D funding directly because of the benefits of that 175 per cent introduction. It gave us a step-up function last year, whereas we would have had to have done it incrementally over the period.

In terms of what R&D actually works, clearly the R&D tax concession is the main one. When it went down from 150 to 125 the impact was significant. Similarly, we have mentioned the 175 per cent, although I have to say that the impact of that is now going to tail off quite rapidly. It was a one-off last year, which definitely influenced our decisions last year. It remains relatively complex and subject to interpretation, but for a company of our size that is manageable at this point, and I come back to the fact that it is our major incentive in terms of the R&D incentives offered by the government.

The Start grant is good, although it is limited. We have used it. It only has a relatively small number. Nevertheless, it enabled us to participate in one of the auxiliary fields on the side, which could be fairly lucrative down the track. Our biggest area for improvement is the eligibility of overseas research. We are very firmly based in Australia. We are listed here. All of our manufacturing is here, as mentioned, but we are a small industry and we do need those global linkages overseas. It is absolutely vital, with 97 per cent of our sales overseas. We need to link into the universities that we work with overseas and participate in some of the work which they are doing over there. So our recommendation would be to increase the 10 per cent limit to allow Australian controlled projects greater access to international R&D. There are one

or two mechanics of the 175 per cent scheme—and I do not need to go into detail on it—to do with the R&D depreciation. I think simplification of the scheme is also important.

I have two other points. I want to mention the long-term nature of R&D. A number of our projects at Cochlear actually have a 10-year horizon; in relation to changes to schemes, sometimes it is awkward to try and adjust to those, particularly in the very short term. Then there is the fact that we are a relatively small market in Australia, and the partnerships with government for us to tackle some of those overseas markets are absolutely essential.

CHAIR—Thank you. I now call Warren King of Raytheon.

Mr King—You are probably aware of Raytheon. You have probably seen a few of our products in action over the last few days. But you may not be aware that some of the things you see daily also came out of Raytheon, like the microwave oven. That is the sort of spin-off from defence into the broader community.

Raytheon Australia is a wholly owned subsidiary of Raytheon in the US, but we operate totally independently through a board. We now employ 600 Australians—we are totally Australian staffed and manned—of which about 150 are professional engineers and 250 are technical staff. Our growth in Australia has been quite substantial. We were 11 employees in 1998 and we are 650 this year.

Obviously our main area of interest in Australia is in defence systems, although much of what we do, particularly in the imagery and geospatial areas, overflows into agriculture, land use and environmental uses. We are focused very much on the domestic market here in Australia, which is primarily the Department of Defence, but we see that R&D must be linked very closely with production and product, because that is where the value stream is. To do that in our market, we have to have a much broader market than that in Australia. I suppose it is important for me to note that I make our comments against a background of a totally underperforming sector in terms of production. The amount of defence production and electronics production in Australia is about a 10th of what it should be relative to our use, and our competitiveness in those markets is very good. Our quality and our costs, as previous speakers have indicated, are very, very competitive. To be underperforming is really almost a sin.

To bring in the benefits of that, we see our focus as being in our regional market and, more importantly, through our parent, through the global supply chain. From our point of view, the US is now the largest exporter of defence product in the world and is the fourth largest importer. Our own company alone buys in—outsources—\$A15 billion worth of goods and services a year. Getting into that global supply chain is a large opportunity for us. We have only been going for about four years but we spend approximately 10 per cent of our local turnover on R&D. We have now turned that into a product line which is currently being bid into international opportunities through our parent.

We also encourage SMEs. We work not just in the R&D arena but also in improving their processes and control mechanisms so that they can become part of that global support chain. We are not actively involved in CRCs at the present. The main difficulty is that they are fairly academically oriented and, unless the R&D outcomes ultimately result in product or services where the value chain is, where the value feedback is, we are not seeing in our domain that

those results are being achieved out of the CRCs. There are some other points that I would rather make in the body of the discussion. Thank you.

CHAIR—Thank you. I now call Lincoln Wood from BAE SYSTEMS.

Dr Wood—BAE SYSTEMS is a global defence company employing about 100,000 people worldwide. There are about 2,700 employees in Australia. We operate in Australia primarily in the field of defence systems, in electronic defence systems plus also customer solutions and support. That is basically supporting ADF assets. In terms of IP policy throughout the company, we do have an internal policy which says that we are able to transfer IP freely throughout the company within the restrictions of commercial agreements, national taxation and security laws, which in the end actually makes it fairly restrictive, particularly in the defence industry.

It is probably useful just to make a few comments about the market environment here in Australia, and it is actually fairly similar throughout most of the Western world. We operate with a monopsony customer; hence the customer policies and behaviours have a powerful influence on the defence environment, including research investment. The Australian Defence Force, or ADF, procures capital equipment via project contracting mechanisms, and the unclassified details of that are listed in its defence capability plan for all to see. This project environment is in fact very digital; it means that it is very difficult to maintain capability between projects and also to justify technology investments for the long term in this digital environment.

Just recently, emerging concepts of network-centric warfare are having a big influence on the way the ADF is thinking and it will certainly have a big impact on the way it procures in the future. In this new paradigm, military dominance is achieved through information superiority, whereas in the recent past it has been achieved through technology superiority and, prior to that, through numerical superiority. This new paradigm is driving the way these defence systems are developed, and these days, in this part of the military systems sector—which, I should highlight, is quite distinct from the platforms sector, which is the ship and aircraft type of sector—in this network-centric model, lots of the technologies now are being driven by the commercial sector. Very good examples of this are computing telecommunications and information technology. They are no longer driven by defence.

Increasingly, our activity involves adopting and adapting these commercial off-the-shelf technologies. We integrate them with bespoke military technologies and, in many cases, very old legacy products as well. In almost every instance, the resulting system solution is software intensive, which by definition means that it carries very high risk. These concepts of network-centric warfare require us to understand an incredibly diverse range of technologies in very complex systems. It does mean that we do not need to own all of the IP in these systems; in fact, it is impossible to do so. What we must do is be able to understand those technologies. Also, these top-down network-centric designs drive internally our decisions on R&D in a top-down manner, whereas in the past, it is fair to say, our R&D investments were driven more on a bottom-up basis.

In Australia we do not actually operate a research centre as such. Our R&D activities are distributed throughout our business and also throughout the R&D community in Australia. We tend to focus on applied research rather than blue sky or basic research. We seek to increase the technology readiness level of research products to a point of maturity where they can be

exercised and exhibited in capability demonstrator programs. Our global HQ, if you like, also invests in Australia, usually in public sector research organisations rather than in the company itself. The Australian company manages this investment on behalf of HQ; in some instances we also jointly invest in this R&D.

The key mechanisms by which we deliver our R&D, in addition to internal programs, include the ARC linkage grants; CRCs; DSTO, the Defence Science and Technology Organisation; CSIRO; universities, through a whole range of mechanisms; and collaboration with SMEs. All eligible research investment is claimed under the R&D tax concession scheme. For us, the drivers of R&D in our business in Australia are really twofold. First, there is the need to gain IP in niche areas in order to gain product differentiation. Secondly, and probably in the future it is likely to dominate, there is the need to develop skills with our key staff—that is, to gain what we call a knowledge advantage.

The R&D taxation concession scheme is an enabler rather than a driver, but it is a very significant enabler for us. In terms of attracting R&D investment from our headquarters into Australia, the key driver is what is called the AII or Australian Industry Involvement scheme—what used to be known as the offset scheme—and a secondary driver, or almost a pull if you like, is the high quality research capability that is available in the Australian public sector research organisations. The programs that currently work for us are the CRC programs, ARC linkage grants, the R&D Start scheme and the R&D tax concession scheme. We support all of those. In terms of suggestions for improvement, we would like to see a return to the 150 per cent tax concession scheme. We would be interested in seeing a scheme specifically focused on the demonstration of technologies. It is a long and protracted route from concept to product, and the most expensive part is towards the end—the demonstration end.

We would like to see a national R&D capability information site. With the very scattered R&D base throughout Australia, it is very difficult to pull together a comprehensive picture of who is doing what and where. In conjunction with that, we would like to see an independent R&D capability maturity assessment of those research providers, which would enable us to more easily select those that we might partner with. We would also like to see incentives for research providers, particularly in universities, to collaborate rather than compete. Looking from the outside, we see a lot of competition amongst universities when we should be seeing collaboration. I would be pleased to discuss any of these points at a later time.

CHAIR—Thank you. I am sorry that we have split up Nortel, with James Clarke sitting down there and Graeme King over here. James, would you like to make an opening statement?

Mr Clarke—Nortel Networks is a global telecommunications equipment supplier. Our corporate office is in Toronto, Canada. Last year, turnover of Nortel was around \$US12 billion—so it is a fairly major player on the global telecommunications scene. The research and development here in Australia is done at our Wollongong technology centre, which was established in 1989. We currently have over 100 staff working on products there. Most recently, we have been able to create and commercialise a global product, the Mobile Location Centre, which was deployed last year to North America and just recently to Europe and some Asian markets.

The importance of a multinational corporation like Nortel Networks to Australia and the research and development done in the IT and telecom sector here is that we can provide access

to global marketing and business opportunities. By doing that, we can then provide direction to where that research should be focused and provide a greater business case analysis. For example, with a product such as the mobile location centre, if our only target market were within Australia, the cost for commercialising that would not have justified developing the product. But looking at carriers worldwide, there is a significant return that we can get from that. Additionally, we have proven productisation and commercialisation processes and the ability to do that.

When Nortel is making research and development investment decisions we look at three types of R&D facilities. One is a resource type facility, where we look at it being low cost but having the ability to do software development, or in situations where we define the requirements very tightly and it can provide that—a contract type house. In countries like India and China we look at resource type labs. A second type of lab would be a market support type lab for where we have to do modifications to be able to bring our global products into that particular market or for situations where we need to provide more direct technical support. The third type of lab is a product owner or a product developer type lab. Typically today the bulk of those labs for Nortel Networks are in North America, with some in Europe.

For Australia, the first two types of those are really not feasible. In terms of our cost structure here, we are going to be above India and China. We are nicely positioned as being below North America but we are still not in the same cost structure for work that could be done in India. In terms of market support, we could do some of that work here but it would be very small. It would not really justify a facility here.

In order to continue the investment we have to have product development labs. Looking at how we can continue with that type of activity, certainly the ideas would be not so much driven by ourselves internally. We would look to the public sector sponsored research initiatives from the collaborative research centres, from CSIRO and from the national ICT Centre of Excellence and to the relationships that we have with them as being sources to help spawn the ideas that we would then be able to commercialise and be able to address global markets with.

Increasingly, Australia is an internationally competitive location for cost and for quality. The skills are here, the quality for doing the work is here, the reputation is intact and we can take advantage of that through opening up and being able to have better relationships with those public sector sponsored research initiatives. Today, really the only mechanism to do that—the only door open—is the money door, if you will. Sometimes, it just is not the case that we are provided the money from the corporate office right up front to be able to do that. But we do have the ability to take those ideas and provide direction in being able to work that. Some of the suggestions offered earlier around the R&D tax concessions and how that could be used in a different manner may be a way in which that could be approached.

In summary, I think we have the right skills and high quality for value added work here in Australia. We have the ideas and the mechanisms to incubate those ideas through the public sector research organisations. Encouraging those organisations to work more with multinationals would be a definite recommendation. In terms of cost, we are nicely positioned. We need to stay there and better quantify that and promote that advantage.

CHAIR—I now call on David Michel from Bovis Lend Lease.

Mr Michel—Lend Lease Corporation is a diversified real estate services group with operations in 43 countries, but primarily in Australia, the UK and the USA. It is made up essentially of two arms. One is a real estate investment group and the other is a real estate solutions group. Bovis Lend Lease, the arm that I work for, is responsible for construction, development and also complex project management. It is responsible for 80 per cent of the company's revenue. The total operating revenues for Lend Lease Corporation are \$12.5 billion, so it is reasonably substantial. Increasingly, Lend Lease is concentrating on developing strong and sustained relationships with a number of key clients, both globally and locally, in a number of business sectors.

Lend Lease Corporation is very much a project based business. Our teams focus very clearly on the specific needs and challenges of a project operating generally under tight cost and quality constraints. Innovations have tended therefore to be project based and aimed at increasing, generally, project delivery, efficiency, safety and effectiveness. The most recent example of this is the introduction of chilled beams. You may ask what they are; I certainly did. It is essentially pumping cold water through the ceiling duct instead of cold air for airconditioning. We are introducing that technology in our new Sydney headquarters building; it will have significant savings in energy and also reduce CO₂ emissions by 30 per cent. Our local design and construction team has been working extensively with our European colleagues, who have used chilled beam technology in a number of developments globally. It is a pretty relevant example of how we leverage our global capabilities.

Innovations have also aimed at differentiating our developments and helping them sell. These have tended to be architectural features or, increasingly, environmental sustainability. For example, in Newington, which most of you will remember was the home for the athletes and the officials during the Sydney 2000 Olympics, there were a number of environmentally sustainable innovations introduced, which led to 15 awards.

Recognising this project based nature of our innovation, we have developed a system of knowledge sharing, which is innovative in itself, called Iconnect. This consists of regional teams that any staffer can call with any issue or question. That team will then process that request and link that individual up with any staff member anywhere in the world who is at the forefront of that particular knowledge. Generally we try and do that within 24 hours, so it is very responsive.

Lend Lease has also capitalised on its significant expertise and experience in project management with the development of Project Web, which is also very innovative. This is a suite of project management tools that are secure, interactive and web based and that hold all information pertaining to a particular project. It creates, for want of a better word, a virtual office space, allowing staff anywhere in the world to access any information on that particular project.

We also, in terms of encouraging innovation, have begun an internal innovation program. That has been working for a few years now and has been quite successful. That is supported at the senior level; it encourages staff members to put forward their innovative ideas and recognises those ideas.

In terms of external drivers of innovation, legislation has been a driver, particularly in the areas of safety and environmental sustainability. R&D tax concessions are a driver but have

marginal impact. Not all innovation qualifies and often it is the client for us who can claim the benefit. We also do not see significant value in clusters, because the time frame is too long, direction is often driven from an academic rather than a practical or commercial viewpoint and there is a lack of exclusivity of intellectual property. We just do not see it as good value for money. Finally, we expect motivation in Lend Lease Corporation to increase in research and development as we continue to develop and foster longer-term relationships with our suppliers and our clients.

CHAIR—Thank you. Jenny Johnston from Bristol-Myers Squibb.

Ms Johnston—First, I will give an overview of the company; then I will touch on a couple of specifics which we believe are driving our R&D investment. The company has been in Australia in two forms, as Bristol-Myers since 1930 and Squibb since 1955. The merger in 1989 brought about Bristol-Myers Squibb today. Globally, the company's key therapeutic areas are cardiovascular, infectious diseases, central nervous system, dermatological disorders and cancer. In Australia the cardiovascular portfolio accounts for about 80 per cent of our product, which is on the high side compared to the other markets.

I think our structure in Australia is not representative of a lot of other markets, because we have quite an integrated approach, with all facets of the business actually located in one place. We have the pharmaceuticals division, which is the major division; we have our manufacturing; we have our research institute; and we have a division called ConvaTec, which is ostomy and wound care. You will get various configurations of this around different markets, but we find that this is regarded as being a very strong and integrated market here, which also is influential in decisions in relation to R&D.

In addition to these key functions, our Australian operation also manages the financial shared services and information management systems for various Asian regions, including Hong Kong, Korea, Malaysia, Pakistan, Indonesia, Singapore and Vietnam. Our operation also carries responsibility for New Zealand. However, due to the extreme cost containment measures operating in that country, we have seen our market fall by about 70 per cent, to the stage where we no longer have an operation there. We sell our products through an agent; there is a global policy against any R&D going into New Zealand—despite some of our researchers regretting that, as New Zealand does have high-quality research too. In 1998 that occurred, and now we really only have the sales activities there.

Last week we had the head of our global clinical research development here in Australia. He announced Australia as one of our key R&D hubs. This is due to the PIIP incentives, which have seen our R&D investment double to what is now \$17 million a year. We believe that is one of the highest investments of R&D in the pharmaceutical industry. I think it is significant that Bristol-Myers Squibb is the largest multinational participant in the PIIP program. We also have a major activity under that program in terms of our manufacturing output.

I asked our research management, with this in mind, what were the key factors influencing the decision of the location of the hubs around the world. The announcement made last week saw Australia take its place as one of 14 international hubs. There are a total of 17, three of which are located in the US. A number of the key criteria they advised that determined the location of these hubs were a combination of the quality of the investigators and the research centres existing in that location, the existing infrastructure and the capacity for information

technology enablement and a strong business presence as well as a research investment friendly environment. I think the integrated nature of our business here put us in a very strong position. There were locations, I understand, that had strong investigators and research areas but, because the business was very weak in those locations, we won out in that respect.

We would really stress that the manufacturing area is significant in keeping that critical mass for the business here. We were disappointed in the Productivity Commission's recommendation that manufacturing not be included for incentives under an investment scheme, because we believe that is a significant driver. It enables us to compete internally. We are finding that Singapore is very aggressive in its approach, and we are losing quite a lot of business from our Australian operation to Singapore. It has also been announced as a hub. Although Australia is a stand-alone R&D hub, Singapore will service a number of countries in the Asia-Pacific region. The Singapore government put forward a number of incentives for the company to establish a hub there; I can give further details of those incentives offline.

CHAIR—Thank you. Brendan McManus from NEC.

Mr McManus—NEC Australia is a wholly owned subsidiary of NEC Corporation of Japan. NEC Corporation of Japan has a turnover of some \$70 billion and a staff of 149,000. It spends some eight per cent of its sales as R&D, much of that on basic research—which, incidentally, is funded where the project is deemed to be in the national interest to an extent of some 30 per cent by the Japanese government. It does a large proportion of that funding on applied product R&D.

Here at NEC Australia we have a turnover of about \$500 million, a staff of 1,400 and a global R&D centre where we employ some 400 engineers in R&D. We have about the same sort of proportional figure—about seven per cent of our turnover is being spent on R&D—and we generate some \$100 million annually in exports. Of course, we are in the telecommunications, computers and home electronics business.

The R&D activities that we are mandated to work on here in Australia are third-generation mobile handsets. We are doing the full design of the handset itself—that is, the integrated circuit design and the software design—although no manufacture of that product is done here. We jointly developed the DSL broadband product with Telstra some years ago and have been very successful in continuing to develop the product. We export it to Hong Kong, Japan—where we have some 48 per cent market share—Malaysia and Singapore, and we operate a domestic DSL network ourselves. We have designed mobile satellite networks and mobile satellite handsets, which were sold to Optus, of course, and to the Italian carrier Telespazio. We are involved very much in e-commerce solutions, providing the Victorian government with its e-commerce network online.

Finally, it is of interest to note that, within our R&D activities, we spend some \$6 million to \$8 million annually on subcontracts to India. We are unable to obtain companies or tertiary institutes that are interested in working as subcontractors to us—working on what is essentially applied R&D, not the pure research and development activities that the tertiary institutes wish to focus on.

What drives the investment in NEC Australia from Japan? There is a need in Japan for access to engineers who are highly skilled in IC design and the latest software techniques. They have a

shortage of engineers, in other words. More importantly, they seek quality output, on-time delivery of the product, working to budget, full documentation, multilingual skills—a great advantage—at-cost competitive pricing, of course, and finally a clear focus on products out the door as part of international standards. We benchmark ourselves on the number of standards we can get taken up within the international standards. And, of course, NEC Australia itself needs products to sell in the local market.

I have some comments to make on the government programs. On the R&D tax concession, first of all, the current strategy of our company in Australia is to plough virtually all of our profits back into R&D activity; hence the R&D tax concession is of limited value to us, as essentially we are not making any profit in the local market. On the CRC programs, I must emphasise that we have limited experience with the CRCs. We are not a member of any. Our perception, from presentations given to us by CRC management, is that they are not as market focused as we would like to see them and are certainly not up with developments in the international standards. Finally, we would like to see the ICT Centre of Excellence as more of a long-term project, doing the basic initial research with outcomes that are not in the one- to two-year horizon that my company is interested in developing products for here in Australia.

I emphasise that the road ahead for us is one of survival. There is obviously a downturn in the industry at the moment. We have not cut back on our activity. We are surviving for the moment, but there is intense competition from Singapore, Malaysia, the Philippines and China to take over those projects that we are currently involved in. In order to continually persuade our head office that we should retain the global R&D centre, we at NEC Australia are focusing on the development of clusters to support our activity—that is, working with local SMEs where possible and with the tertiary institutes to get them interested in working on the applied R&D activities that we require support for. We have had some experience with it. Generally speaking, their project management is not what we would require but we are nonetheless prepared to work with them to overcome difficulties and persuade them that there is value in totally supporting our ICT R&D research activities here in Australia.

Dr Cook—Boral Ltd is a predominantly Australian building and construction materials company, with operations either wholly owned or in joint ventures in the United States and Asia. For the financial year 2001-02 sales revenues were \$3.5 billion and gross assets \$4 billion. We employ 11,800 people directly—more than that when our joint ventures are included. Building and construction contributes 5.6 per cent to GDP compared with mining at 4.9 per cent and agriculture at 3.2 per cent. All these sectors are mature and are unlikely to provide more than marginal returns on basic research outcomes. As a consequence, Boral, like many other companies in these sectors, places considerable emphasis on the development component of R&D rather than the pure research—R—element. This is focused on protection or enhancement of its competitive position through continuous process improvement, the development of new products and meeting its greenhouse and sustainability commitments.

Every effort is made to ensure that competitive advantage is obtained from all R&D activities, either through patents or licences. Where it is clear that such protection would not be granted, R&D is used to drive market leadership through differentiation, with new products and improved product performance. With respect to innovation that is carried out in Australia, Boral has specific mechanisms to ensure that what is undertaken is consistent and in terms of its applicability is suitable in terms of all its operations. We undertake regular benchmarking and

we identify whether activities that are undertaken in Australia can be transferred to our operations in the United States and Asia.

With respect to government programs, Boral is supportive of the R&D tax concession scheme but has been disappointed with changes in the past to the concession rate; others have mentioned that today. Interaction with public research agencies, with the CSIRO and universities, has generally been limited although indirect interaction has occurred through industry associations and this includes interaction with the CRCs. So we do not have any direct interaction with CRCs.

The R&D initiatives supported by the Australian Greenhouse Office have been of particular interest regarding efforts to reduce energy, to recycle waste and to reduce carbon dioxide production, particularly relating to the cement industry. A New South Wales government initiative focused on reductions in energy consumption, particularly electrical energy, has also been welcomed. Thank you.

CHAIR—Thank you, David.

Dr Pulsford—Varian Australia is a Melbourne based subsidiary of a US corporation. Our business is to design and manufacture scientific instruments. These are used pretty widely in industry and in academia globally. We do the full thing, from market research right through to manufacturing. We have about 400 people in Australia and another 400 around the world and we export about 95 per cent of what we produce. Varian style is to do its thing for the whole world in a particular location. About one-third of those 400 people are in R&D or switch between R&D and manufacturing/engineering. We have a very high integration between R&D and engineering and manufacturing. We have all types of engineers and scientists. We are heavily into computerised design tools. We have been successful and we are progressively transferring responsibilities for future developments in some product lines from the US. We have had some success, therefore.

The R&D that we do is totally towards developing commercially successful products, so we really do not have much relationship with universities, CRCs, clusters or the like. Our experience has been that those people generally do not work within our time frame—we have quite tight time-to-market targets—and they generally do not seem to be interested in the more applied type of research. We do not do very much blue-sky research; we are very much engineering oriented. But we do expand our product offering. We do not just grow on it but we have gone into new product lines progressively over the years.

Varian actually sees Australia as a good, productive, relatively low-cost place to do R&D. We have benefited from particularly the Start program in recent years. We are just coming out of a significant Start grant. We obviously also get an R&D tax concession. That is nice to get, but it is getting worth less and less all the time. The percentages go down and the tax rate goes down; the compliance does not. We are typically doing maybe 15 or 20 projects at a time, which means we have to go through the process for 15 or 20 such projects. I guess compliance at least would be nice to win over if we could not get the percentages back up.

We do have a relatively skilled work force in Australia. We do not find it easy, I have to say, to get the quality of people that we would like. We are in a globally competitive market. Our major competitors are North American or European. They are the ones who set the rules for us.

It is important to get the right people and to be able to comprehend the scope of the regulations and the like that we have to work with. I mentioned Australia's low cost base. The infrastructure we have here is efficient. We have sister corporations who make instruments—but not our instruments—on the west coast of the US and in Holland; we have good communications between the three operations.

We thought a little bit about what could be done—perhaps not at a detailed level, but in general—with R&D programs. We think probably the best thing would be to strengthen the linkage between the R&D and the commercialisation of R&D. As I mentioned before, we basically only do things for a commercial outcome. We feel we have to develop as much wealth out of R&D as we can for the country, from the point of view of both employment and wealth in export earnings.

Earlier, I mentioned CRCs, universities and clusters. At this point in time, we have only one project with any external operation, and I do not expect that will change in the short term.

CHAIR—Thank you. Holden—Brent?

Mr Dankesreither—Thank you for the opportunity to participate in the discussion today. Holden employs almost 8,000 people, mostly in Victoria and South Australia, and it manufactures vehicles and engines for domestic and export use. In 2002 Holden sold more than 183,000 vehicles, achieved 22.3 per cent market share in a record market of 824,000 units and produced 203,000 engines.

We take our position as an engineering leader in this country extremely seriously. Holden is one of five centres of excellence within the GM world. Our engineering and design department has increased from 520 to 770 in the past three years and we have plans to increase this to above 800. As part of that, R&D is essential for the sustainability of the car industry. To achieve economies of scale we must increase volumes through increasing exports and import replacement.

Holden has a long history of innovation and development activities, and we are the highest spending private sector R&D company in the country. For the financial year 2001-02, Holden invested \$149 million. As outlined in Holden's submission to the standing committee, Holden's R&D has focused on product and process development, the generation niche vehicles such as the Monaro, safety research and innovative concepts such as the ECOMmodore hybrid vehicle. Successful innovation is the only available route by which the local vehicle industry can win back market territory lost to imports. The official launch of Holden Innovation next month further demonstrates Holden's commitment to research and development here in Australia. For the first time, Holden will have a single, stand-alone operation, developing innovative future vehicles, new product and manufacturing technology and concept vehicles. It will have a strong affiliation with GM's other specialised research facilities around the world.

Holden Innovation will complement our existing R&D activities and provide a catalyst for innovative development. Holden Innovation will link our business plans and brand positioning to global and national societal trends by identifying and creating domestic and export opportunities. It will formalise relationships with some of the country's leading research and educational organisations.

Holden Innovation's scope covers three areas. The first is product concept synthesis, examining what might appeal to customers well into the future, what types of vehicles Holden could produce to meet these needs and which of these vehicles might ultimately become viable products. The second is product concept execution, where future Holdens and concept cars are created in accordance with Holden brand values to meet the identified market opportunity. The third is innovation in technology, safety and restraint systems, vehicle IT systems, crash avoidance, environmental technology and virtual engineering and virtual manufacturing simulations. Importantly, Holden Innovation includes an agreement with VPAC, the Victorian Partnership for Advanced Computing, which will enhance our computing capacity and enable us to do the most advanced computer modelling in Australia.

We will also continue to work closely with CSIRO as an extension of the expertise we developed with ECOMmodore and with universities such as Monash through their group MUARC.

The R&D tax concession is the principal funding mechanism used by Holden to offset its considerable investment in R&D. The scheme is important and it is delivering benefits to Holden, the industry and the Australian economy. However, the impact of the benefit is insufficient to enable decisions to invest in higher risk R&D that will underpin the transformation that the motor vehicle industry must make. In addition, it is Holden's opinion that the current support mechanisms do not place enough emphasis on non-product development aspects, such as commercial opportunity quantification and cost-effective means to produce the product in low volumes.

That said, the decision for a multinational to invest R&D capital in Australia is not purely based on the level of support. Company tax rates, local policies, technical expertise and availability of engineering resources are also considered. It is also important to note Australia's position on support for R&D when compared with other countries. It is currently lagging behind other developed countries. Following reductions in both the R&D assistance rate and the company tax rate, Australia's investment incentives are less than those offered by developing countries, and many of those are in our region. This creates significant competition for Australia.

In summary, to maintain the long-term viability of automotive manufacturing in Australia, we will need to become competent in all areas of the product-to-market value chain. Consequently, any changes considered to enhance the existing R&D support mechanisms should provide incentives to develop Australian expertise in the additional area of concept development to assist in increasing the incentive to invest in highly innovative R&D initiatives. Australia's position on provision of support for R&D relative to all other automotive-producing countries must be considered in any policy review. In addition, reform of R&D assistance mechanisms is required to ensure that at least some aspects are closely targeted at highly innovative R&D and that they are accessible by the automotive industry. A mechanism for encouraging such activity, for example, could be provided as a graduated subsidy based on the level of innovation.

Holden is committed to working with the government to ensure that an appropriate policy environment exists to support the required activity in the automotive sector. Our commitment is not simply mouthing platitudes; it is about dedicating a considerable amount of our own resources in this area to ensure the future of Australia's largest car manufacturer. Further details can be found in our submission to the standing committee. Thank you.

CHAIR—Thank you. You mentioned company tax going down, and tax concessions and a sort of a drop in incentive. I presume you were not arguing for a higher company tax rate?

Mr Dankesreither—No, that is quite true.

CHAIR—A number of you might want to comment on what people have said in their introductions as part of the discussion. Feel free to do that as we go through. With that in mind, maybe I could start. Lincoln Wood commented about top-down decision making. Lincoln, do you have a comment with respect to the GSK proposal of the benefit of tax concession coming in or being seen as income to help in that type of decision?

Dr Wood—I can certainly understand the comment. In our case it probably would not be an influence, but I can understand why that comment is made. In, if you like, a tightly coupled organisation like ours, the benefits of the tax concessions are such that any increased benefits are ploughed back into the R&D investment. So it is not the case in our organisation that that would drive our investment at all.

CHAIR—Does anybody else's organisation see a problem between the decisions made about R&D investment and the actual benefit that is coming through tax concessions? Do you have organisations where there is that sort of gap and where a change in the way proposed by GSK might help?

Dr Bradlow—In a business where the R&D decisions are effectively made by business managers, as opposed to senior management of the company, there is enormous benefit in the proposal that is being put forward because the individual business unit managers in the current environment do not see the tax concession benefits as flowing through to their bottom line, and that influences their decision making.

Dr King—We see the availability of a skilled work force and being cost-competitive with other locations as being of much more importance than visibility of the tax concession. It would be of some significance but not as significant as the other factors.

Mr Mitchell—I do not think it would have much impact at all. Within organisations you have the ability to disclose things however you want in terms of management accounts. Certainly we make it very visible what the impact is. So from an internal point of view that is very visible, but from a legislative point of view of again having to have more disclosure in a particular style, I would vote against that.

CHAIR—So you would say there is a downside.

Mr Mitchell—I would say there is a downside, and I think you can do it internally without having to have a disclosure rule.

Ms Lyon—It is not any additional compliance work from a company's point of view. The current tax concession with our existing tax rates and the 125 per cent deduction, when you convert the benefit of that to a pre-tax income equivalent, is actually more than 10 per cent of your eligible R&D spend. So, if you spend \$4 million on an eligible R&D project, the government is, in effect, funding about \$428,000 of that in net economic benefit to the corporation for carrying out that project. I am not sure that everybody sees that and does the

calculation internally to see the extent of the contribution towards that project. When you start being able to claim the 175 per cent concession, the numbers become much more significant. It is obviously more than three times that. GlaxoSmithKline obviously has a parent company located in the UK. When R&D people are looking at Australia in terms of where to place R&D, I think that being able to see that quite clearly in the R&D budget is a significant driver.

Dr Bradlow—Obviously this has a much bigger impact in a business of 40,000 people than of 400 people. So you would have to bear that in mind.

Ms CORCORAN—I have a question about contracting out to India. Could you explain that?

Mr McManus—Yes. We have a need within our R&D activities to call upon engineers to design, and give us assistance in some specialised areas of, software.

Ms CORCORAN—So it is R&D work that is contracted out?

Mr McManus—Yes, where we need the specialised assistance on that particular software, we are not able to employ engineers across the full range of software skills. From time to time we want to go out to another organisation and say, 'You do this work for us.' We are unable to find companies here that will do that work in the professional way we want. The Indian companies are very proactive. They will fly here continually—they will even station people here to do the work temporarily—and our general managers responsible for the divisions are quite happy to go on working with them.

Ms CORCORAN—Is that because of a lack of skills in Australia or just repeated change and having to work differently?

Mr McManus—A lack of, I would think, companies and individuals, contractors, who are prepared to promote themselves, who have those skills and are prepared to work to the time lines and budgets that we require.

Mr LINDSAY—I would just like a quick discussion about CRCs because that has come up in a number of submissions this morning. I just want to ask four questions. The first suggestion was that CRCs tend to be university led. I ask: should there be any other model of how CRCs should operate? The second question relates to the complicated contractual arrangements with CRCs. How do you fix this? Is there some model of how you can sort that out? The third suggestion was that CRCs are not involved in applied research. Should they be? Finally, I was interested in the suggestion that we should perhaps be thinking about a model of a world CRC to take advantage of overseas research. Do you think that would be possible?

Dr Wood—I would like to comment on the first point. I have had close association with a CRC program right from its inception, and with a number of CRCs. My observation is that there are many different animals amongst that set of CRCs. Some are very tightly focused on industry; some are industry led. Some are incorporated companies whereas others are much looser affiliations, if you like. It depends a lot on which ones individuals have exposure to as what their reactions and comments are likely to be. Those that are particularly focused on industry—at least those that I have had association with—have been very successful. One of them, the CRC for Advanced Composite Structures, was one of the original ones in the first round and it achieved its success through essentially being industry led. That one is not

university led but obviously has a strong university commitment to it. So I would suggest that it depends a lot on which particular ones we are talking about.

Mr King—The Electronics Industry Action Agenda looked at that issue and, from memory, one of the things the figures determined was that the conversion of R&D in Australia into product was well below benchmark standards. The problem is that you are talking about fuelling a system that is not producing outcomes. That should be to some extent self-fulfilling. For many, where your product base and your market base are large enough, the return on product sales is sufficient to fuel and incentivise you to do R&D in any case. The Electronics Industry Action Agenda looked at, and I think has recommended to the minister, the formation of an industry led group—although I must admit that the universities were very keen to participate—to concentrate on productising R&D. We heard several times this morning about that serious gap between that blue sky—R—and the application and the D end.

I think also the perception that we have is that the more you get towards the D end, the more you will be put under the microscope about the suitability of your activities for R&D concession, which seems a shame. It seems a shame to have to try and convince someone that what you are doing is taking that product to a real income stream. Certainly the more you get to that part of the spectrum, the more difficult it becomes with circumstances to justify your activities as legitimate. I think Holden were sort of reflecting on that end of the thing.

CHAIR—Where is that action agenda at?

Mr King—I think the paper is being completed and is being submitted to the minister for industry.

Miss McGovern—I just want to take up your point, Peter, about world CRCs. At GSK we employ somebody whose sole job is to work on building collaborations with Australian universities, biotechs and SMEs. About \$8 million of our \$30 million R&D spend in Australia is on collaborations, and a lot of those collaborations would fit that bill in the terms of linking organisations—say, the university here in Canberra with Barcelona, Verona and places like that. I do not know quite how you would actually get government assistance for that, because it does link into your complicated contractual arrangements—and they are very complicated contractual arrangements. But any way of looking into how the government could encourage that would be fantastic. Linking Australia into the world research community is the main driver for us of how to work here—any way that that could be extended would be fantastic.

Mr Mitchell—I would just like to really support that. We have a number of these collaborations with overseas universities. For our industry, which is all export, this is absolutely vital—to keep in touch with all of those. Anything that could be done to encourage those in a more structured form would be terrific.

Just on the CRCs themselves, I think our experience is mixed, although we are currently working with the University of Melbourne and the bionic ear centre down in Melbourne—and we have right from the start. We have had terrific research come out of that. That has been a really positive experience. But I think we have played a very major role in that and driven quite a lot of the agenda. From our point of view, I think they are a very important part of our research. Certainly we showcase that CRC to overseas people and surgeons and so on when

they come through. But I think it is on a case-by-case basis, which is what Lincoln is talking about.

Dr Pulsford—I would like to ask Neville a question. Since you have had that fairly intensive relationship with the CRC, where does the intellectual property go? That is another one of your questions. Where does it go? We know where they think it should go.

Mr Mitchell—No. We have usage of it, obviously, but, you are right, that is always the tricky part—where does that intellectual property reside and how do you actually work it?

Dr Pulsford—It is a very difficult situation. If you do not have a large commercial outcome, they expect a very high reward for the property, which may not ever come back commercially.

Dr King—As Jamie mentioned, the CRC and working with public research organisations are going to be very important for the future of our facility in Australia and the products we develop. The ICT CRCs were formed in a different economic environment, and the industry has now gone through a downturn. As Jamie mentioned, they always want the money door open. When they see a multinational, the first thing they think is, 'Here's more money.' But the world has now changed and ICT multinationals just do not have the kind of money to support the model under which they have been formed. We have started to talk to some of the CRCs, and the difficulty for them is to start to change their concept about how they engage with industry and see it more as a partnership thing where they are developing ideas, looking at commercialising them jointly and earning their money that way rather than getting up-front capital payments. That is a big concern to us.

CHAIR—Yes, good comment.

Dr Bradlow—I want to make a quick comment on university led versus industry led. If you look at the key metric, which is how much money industry is actually putting in, you will find it is less than 20 per cent of the overall CRC budget. It is of that order. That to me says that industry is voting with its feet.

Ms GRIERSON—I want to comment on the pure research versus the applied research commitment and responsibility. Obviously, your investment in R&D is market driven and productivity driven, and it is certainly about maximising output for you in terms of sales. But, if university models and higher education models are now moving towards less public funding as well, we have this dilemma of just who is going to invest in pure research. It is very hard to quantify the benefits of pure research, but one would think we only got here because of some of that. What is needed to make a greater incentive? If higher education is going to have to compete for that research dollar as well and as hard as you perhaps do for your market, what do we do to give incentive to pure research or to give incentive to you to commit to pure research, not just applied and market driven research?

Mr Dankesreither—We at Holden believe that it is very much a grassroots issue. We have pretty extensive contact with both Melbourne based universities and overseas based universities. We find that lecturers somewhat enjoy working in the blue-sky region, and offers to try and give some industry/commercial reality to those people who are teaching our future engineers and future scientists and so forth are somewhat lacking. It is in very early stages, but one model we are tossing around at the moment at Holden Innovation is to provide some kind

of mechanism whereby lecturers of suitable qualification for the automotive industry can come to Holden Innovation, work with technologies and tools that are not available in the academic institutions with generally applied industrial needs and then go back to their students and pass that information on. They can actually tailor their courses. That is not to reduce the theoretical content; I think we would all agree that we do need to have theoretical content. It is the link between that theory and the commercial application that is somewhat lacking. The approach that we are taking is more a pull than a push. We are trying to engage the more responsive universities to allow their lecturers to come and work with us over summer under some arrangement that I guess is to be determined.

CHAIR—Does anybody else have a comment on that initiative?

Dr Pulsford—We do not have very broad experience; we are just not big enough to do that. But there are probably two comments I would make. One is that we rarely find a person in the academic world who actually wants to work on a commercial project with us. When we do find them, they want to keep everything for themselves and view us more as a charity to let them continue to play with their blue sky. You have to have both, but it is a little daunting at times, which is why I am intrigued with your experiences with intellectual property. We have a relationship going at the moment, but part of that relationship requires to actually fund the institution's patents. They would not fund them themselves, and we saw no advantage in going any further with them with no patent protection. We had to fund their patents and write a commercialisation agreement. Now we have to figure out how we share the intellectual property that is generated now that the relationship has started. It does not answer your questions at all.

Ms GRIERSON—No, but it raises some good issues, thank you.

Mr McManus—I think you have to understand that we are one per cent of the action of our head office, and they are doing the basic research that we at NEC Australia will never be allowed to do—to get into the pure research world. We will always be in the applied end, right up at the product interface. Our desire here in Australia, though, is to work with whatever pure basic research is being done, to pick up those ideas, to respect the intellectual property in them, to bring them into the applied R&D products and to launch them into the international market, with international standards, so that we can assist in making sure that whatever pure research is done is brought right through to the market. NEC will never be involved in pure research here in Australia—not when it can get a 30 per cent discount from its Japanese government.

Mr King—I want to draw not entirely on Raytheon but also on some previous experiences. One of the ways I got rid of my R&D budget in a European operation I worked with was to tie their income to receipts—to sales. I got rid of my budgeting problems overnight. It is a very simple model in a very small company, but I gave them 12½ per cent of any product that was sold. They suddenly had a desire to get IP over the fence, into production and out the door. You cannot necessarily apply that on the macro scale. The problem that I see is that the people that do the R&D are not necessarily the people that should manage R&D. This is where you sometimes run into difficulties in trying to work with the universities. You really need another management layer sitting around. The thing that is going to make someone good at R&D is probably not going to gear them well for business; there is that missing layer of commercialisation.

We are also not challenging it enough. We should challenge where the R&D budget is going and what it is doing for Australia. To be absolutely confronting, should we do it at all? As an example, I bought IP out of Europe—someone there has done a lot of R&D on it but had not got it to a product—and spent virtually nothing on it. It now is an export from Australia and it just goes on every year. You have to challenge that, if your R&D does not get to an outcomes base—whether that is a better quality of life, or a product or service—then, overall, what is it for? I do not think that we are challenging that enough, to be quite honest. We are trying to manage what we have instead of being confrontational about it and asking what it is delivering for us.

Dr Cook—There is a perception of the public research institutions that the building construction sector does not invest in R&D. That is a misconception because, as I said, innovation is a significant part of most companies in the sector. As much as anything, the reason for the lack of interaction with public sector institutions relates to things that have already been said this morning. The timeliness of innovation that we would consider placing in public research institutions is something on which, in the past, we have had our fingers burnt. The other issue that has been raised is that of intellectual property—again, we seek the dollars that we spend to directly relate to our competitive position. Unless we have intellectual property protection and given the circuitous arrangements that have already been identified, we will simply do it in-house. We are involved in the development of the products and services that we know and can bring to market at little or no cost.

Miss McGovern—From a pharmaceutical company perspective in terms of pure versus applied research, we have a very different perspective and a very different experience. One of Australia's best competitive advantages for us in terms of investment in R&D is the enabling technologies and the biotechnology companies. In investing in those you might often come out with the first step of something that might, 20 years later, deliver an outcome in a commercial sense. So those enabling technologies partnering with biotechnology companies is a massive part of what we invest, and one of the main reasons that we do invest, in Australia. It is a very long time frame in terms of researching gene screening for early disease factors and indicators. It might take 20 years for that to become anything marketable but, for us, if we do not do research and development we end up with nothing at the end of the day. We have to take the risk.

Ms GRIERSON—Does that suggest that in some fields we are still state of the art in terms of our research and in other fields we are lagging behind? Or are we not competitive when you take in all those other factors? Would that be the case? Would you claim that we are still ahead in biotechnology and research?

Miss McGovern—Very much so.

Ms GRIERSON—And you claim that you can buy engineers anywhere? Is that right?

CHAIR—Jenny will dispute that.

Ms GRIERSON—You dispute that?

Ms Johnston—This is the pharmaceutical companies' perspective, and we are probably a few years behind GSK in its focus on alliances with the local biotech sector. The reason that we announced the hub aspect was the alliances, the focus on biotech and the recognition of the

excellence here in Australia, to the extent that we are considering exactly that: one person dedicated to the alliances and partnering aspects.

Ms GRIERSON—But you suggested that if the industry specific incentives were taken out you would perhaps look elsewhere.

Ms Johnston—Over time, we would see a pulling back of that, both in manufacturing and R&D.

Miss McGovern—It is the capacity to capture those spill-overs which are so much higher for R&D than they are in other areas of the pharmaceuticals.

Mr Mitchell—I do not think Australia can ever be an expert on everything. We have got to concentrate on some of the areas that we are good at, which I think is what Catherine has been saying. One area where I think we are leading is in cochlear implants in hearing health networks, which is what we are. But even with that, we do need to be very mindful of these linkages overseas. That is why—coming back to the specifics of the R&D concessions—we keep bumping into that 10 per cent rule. All the benefits are going to come back to Australia, we are a majority Australian owned company—the dividends flow out and all of that—but we are bumping up against that 10 per cent and we have to have those linkages overseas if we are going to compete with our American competitor. That is an important aspect of it.

Dr Bradlow—I dispute this notion that somehow we should not be doing the R&D in Australia. Clearly there have to be focus areas, so for those parts of a value chain that are increasingly turned into commodities—some of the vendors here representing our industry are increasingly operating in commodity parts of the value chain—or where you have to have a global economy of scale then the value of local R&D to Australia has diminished. But there are still huge opportunities in other parts of value chains or in other industries, and it would be condemning our children to be a branch office economy if we simply abandoned R&D in those fields where we clearly can and will be competitive.

Dr WASHER—In summary, from what I hear today there is general disappointment from CRCs and clusters in the development phase. What we are gathering is that research in Australia is pretty healthy basically but development is lousy and CRCs and clusters—where we put most of our federal money into CRCs of course—have been a great disappointment in the development phase. Is that a consensus? Does anyone deny that?

Dr Wood—I think my experience is somewhat different.

Dr WASHER—But that is exceptional—it sounds like it is exceptional. Dr Hugh Bradlow, you brought up the IP and the fact that we tax people on this. The reason the tax changed from 150 down to 125 per cent and then up to 175 for new research was because of rorting; it was alleged that change was brought about by that. It would seem that the government taxes people in intellectual property and also the cost of intellectual property with IP Australia. We could avoid rorting and actually help industry—and remember it is the development phase, it is not the research we are talking about—but the big problem is that Australia cannot develop; Australia can research. Do you think we should be addressing that with a greater focus?

Dr Bradlow—I agree with you that we should be addressing the rorting as a specific issue rather than trying to reduce the incentive to the R&D. The fact is that the changes to 175 per cent are based on increased R&D and in an organisation like ours where R&D spend is driven by business requirement, it tends to fluctuate fairly dramatically. By the way, we do have a bigger R&D spend than Holden. Ours fluctuates between \$160 million and \$220 million a year, but it does vary on a year-to-year basis, so there is absolutely no chance of us taking advantage of that extra 50 per cent concession. On top of that, the commercialisation process is thwarted by some arcane tax requirements which are quite frankly not of any value to the Treasury in terms of what they yield but are considerable inhibitors to actually getting commercialisation done. I do not think it requires rocket science to make significant changes to those types of impediments.

Dr WASHER—I am glad you said that because I agree, so that is great.

CHAIR—Before you go to your next question, Mal, Robert Clark from Holden would like to comment on that point.

Mr Clark—We will not get into an ‘ours is bigger than yours’ argument with you, but we find ourselves in a similar position in regard to the 175. At the end of the day we have a fairly constant high level of spend, which means that we cannot take a huge advantage out of the 175 concession either.

CHAIR—I will come back to you in a second, Mal, but I want to take this a little bit further. One of the proposals that was put to the committee during the inquiry was to have a series of levels of tax concession that might range from as low as 110 through to 200, the idea being that would provide a specific incentive for businesses to do that bit more. Do you think, in that case, it would not really work?

Mr Clark—We certainly put forward the proposal in terms of our submission that identified a graduated scale based on the level of innovation involved. That probably goes back to the argument about how you incentivise blue-sky R&D. We were looking at—ignoring how you would practically administer that—how you could have different levels of benefit based on the level of innovation contained within the R&D. That would still give you the benefit for the D end of the scale—which obviously we are very heavily involved in, as are many of the other companies here—while also gaining the benefit for the high R end.

Dr WASHER—The other thing that was proposed to us—and I want a general comment on this—from FASTS was a proposal to use post-doctorates from university and put them into industry, subsidised 50 per cent by federal money. One of the comments I have heard a number of times today is the fact that our university graduates seem to lack some developmental skills; in other words, they tend to have low applied levels in certain fields. What is the consensus? Do people feel that it would be of benefit if we encouraged post-doctorates, through a range of activities, to work with industry, with half the wages funded by the federal government for a period of, say, three to four years or whatever?

Ms Johnston—I would say yes from our perspective. It came up a lot in the Pharmaceuticals Industry Action Agenda that there was that big gap between the science skills and commercialisation. There was a lot of discussion around how you might facilitate that. That was

one of the suggestions: that we have an exchange and two-way traffic between the institution and industry. So, yes, I think we would agree with that.

Mr McManus—I particularly would like to support that concept. Perhaps, though, I would just like to be a little bit careful about the manner of funding. I would like to see perhaps a modification of the Start program to allow large companies like ours to apply for funds. We would then be required to commit the funds to joint projects with SMEs and the tertiary institutes.

One area where we would want to perhaps get some funding ourselves would be the funding of the project managers. But we would want to particularly focus on drawing those SMEs and tertiary institutes together to work on applied R&D, not pure research. These funds should be available to MNCs that are doing at least \$10 million of research here in Australia so that we can overcome the problems we have of not linking with the tertiary institutes and SMEs and so we can get research done on those projects that we are working on but where we are not too sure of what we are doing and what way we are going. We would like them to tell us what the best way of going about the project is.

But to take up Mal's point—that we would then be exchanging engineers in and out of our laboratories with theirs so that both undergraduate and postgraduate could get that sense of working in a project environment on time, to budget and with all of those things that we require to compete in an international market—I would support the idea.

Mr Dankesreither—Just in terms of more the outcome rather than the mechanism, we at Holden are finding consistently, as a large employer of mechanical and other engineers, that engineers come out of university without the ability to properly use state-of-the-art computer simulation technologies and so we invest a lot of time and a lot of money in taking raw graduates and giving them the capabilities to do virtual engineering simulations, virtual manufacturing simulations and the like. We have invested in a computer lab at RMIT to try and foster this and that has been somewhat successful, although now it is getting dated.

But we do find that once we have trained up our engineers they are very quickly off overseas. We do our best to retain them but the opportunities for them here in Australia still do not quite match what they can get either in our competitors overseas or in our other subsidiary companies.

Just to respond to Dr Bradlow, I think the *Melbourne Age* must not include Telstra as a public company. It is a private company.

Dr Bradlow—It has 1.5 million shareholders.

Mr Dankesreither—Yes, I know.

Dr King—I would just like to return to the suggestion that has been raised by one of the other people about dropping the R&D tax concession to 110 per cent in some cases. There are two points that I would make about that. One is that, if it were at that low a level, the cost of claiming it would mostly consume any benefit whatsoever that the concession would have, so it would be totally ineffective. Secondly, we have talked a bit about trying to raise the profile of the tax concession with decision makers, some of who will be overseas. I think any dropping of

the tax concession would be an immediate signal to overseas decision makers that Australia was calling it quits in the R&D space.

Ms GRIERSON—If you are not here, if your company does not decide to stay in Australia, then the R&D spend goes with it. I just want to ask this: how do we overcome domestic market size—and how important is it—so that your actual ability is to engage enough product sales within Australia, not just export capacity? In the pharmaceutical company, you would be looking at our approach to supporting the marketing of pharmaceutical products. You would be looking for some industry incentives here, and each industry would. Are there any generic things that are possible, or are they all very different in terms of those incentives to increase domestic sales? Broadband might be vital to the telcos et cetera; that really would be a government investment. Is it too different to make any generalisations? Does market size here really impact or is it not at all a factor for you?

Miss McGovern—One of the things that I would say that I suspect many people in this room find is that, in any company that needs to deal with government in terms of access to market or product regulation, clarity and transparency of government regulations would be something that most of us would find an issue with. If those processes and regulations are not transparent or the application of them is not transparent, that sends very negative signals to us. I do not think that relates to just the pharmaceutical industry, although we might be a somewhat extreme case of that. I think it would be actually something that the telecommunications companies possibly also find.

Mr Clarke—Perhaps I could make a comment about markets. It is not so much market size here in Australia but probably more the similarities of the industries in Australia with markets in Europe, North America or other parts of Asia. I think that is a huge opportunity for us as well. If our applied research is focused on ways in which we can improve the competitiveness of the local industries, that has direct applicability to global markets, and then we are able to expand those developments out.

Ms GRIERSON—So the Westernised consumer market here would be compatible with your others—

Mr Clarke—Absolutely.

Ms GRIERSON—And that would be enough. Thank you.

CHAIR—Probably a very consistent comment that has been made to this inquiry is that the domestic market is almost irrelevant to any sort of decisions about R&D and taking that to product development. If you do not look at the export market, you do not even start to look at R&D. Do people generally agree with that?

Ms GRIERSON—And you are not benefiting our economy very much either if you do not.

Dr Cook—It obviously does not apply to the building construction sector, but the competitiveness of the building construction sector in Australia has led to the investments that it has been able to make successfully, particularly in the United States and also in Europe. As David was saying with respect to Lend Lease, the things that they have done through

innovation, while focused on the domestic market, have enabled them to expand internationally. It has been much the same with Boral in that context.

Dr WASHER—There is just one other thing. I have to go soon; I apologise. On this domestic market issue, Jenny mentioned that you withdrew from New Zealand. I thought you indicated that the Australian market was still suitable, but in possible jeopardy. Could you flesh that out. In the pharmaceutical industry, it is our impression that the domestic marketplace, through the PBS, is going to cause us some grief—not only from the point of view of local investment here by the pharmaceuticals we have but also in terms of free trade agreement because of our new agreement that we hope to achieve with the US. They have targeted us. Can you flesh that out a bit so that we know what the Americans are going to do ultimately? You might give us a mirror into what is going to happen.

Ms Johnston—I know that the US industry has been emphatic about not dismantling the PBS. Probably the areas that Catherine referred to in terms of process transparency and certainty in the listing reimbursement process are the only areas. There have been a lot of furrphies going around that the industry is actually targeting the PBS. It has been at pains to state that that is absolutely not the case. We are a strong supporter of the PBS. We have been operating in that system for 50 years. Yes, it is heading to a tighter and tighter cost containment model. That is problematic, and I think, most significantly, the transparency issues and predictability of the system are probably something that the industry would be looking for. Other than that, we have been operating under the system for some time and are quite happy to continue to do so.

Dr WASHER—Yes, that is the minutiae of what I would be interested in.

Miss McGovern—I would agree with Jenny. We are very strong supporters of the PBS. We are very committed to the fact that it does deliver equitable health care to all Australians. In terms of processes and so forth, though, some of those processes in our case are actually directly impacting our capacity to do R&D here. As I know you are aware, we have a diabetes product that got a positive recommendation to be listed on the PBS over two years ago. That product has not been listed. We are looking at doing more research in the diabetes area. Our global headquarters is looking at Australia and saying, ‘Well, the government’s committees have said this product should be listed. It is not listed. Why would we throw more money into a market that is actually not even recognising its own committees in making the product available to patients?’ That is concerning us greatly, particularly considering the disease area and the number of people who are suffering from the illness. That is a great example of where regulation is causing some debate. A huge issue of concern for the industry is what will be the longer-term impacts on our capacity to do R&D here if this continues.

CHAIR—We are nearly out of time but this is an excellent contribution. If my colleagues can hang on for a few more minutes I have a couple of extra things that I would like to raise. Hugh, you mentioned in your opening some of the problems in pre-seed and IP. Would you give us a bit more on those two areas or some suggestions where we can make some changes?

Dr Bradlow—Yes. I am afraid I have a somewhat parochial beef about the pre-seed fund, which I think is an excellent idea. The same concept has come up a number of times. Brendan mentioned the context of Japan putting 30 per cent into industry R&D. The fact is that no industry likes investing in very high-risk opportunities; anything that government can do to de-

risk industry investment is going to ultimately be beneficial because it will encourage that investment.

In the case of the pre-seed fund, you have a situation where that is happening but Telstra Research Laboratories are excluded from participating because we come from a private organisation. Even though we are doing research with just as high a risk—and probably with a greater degree of deal flow than any of the universities—we are not capable of participating in that. It would be beneficial to look more widely at what you could do with something like pre-seed funds.

CHAIR—Are there any last comments that anybody would like to make to add to the discussion this morning?

Mr Clark—I would just like to make one more. It is something we have touched on, and perhaps we just need to highlight it. Everybody here has mentioned the compliance burden associated with the current R&D tax concession.

CHAIR—Yes, I was going to raise that myself.

Mr Clark—I think that is a significant issue for most organisations. As the level of the tax concession has reduced from 150 to 125, the offset benefit associated especially with the larger spenders in terms of maintaining the requirements around the R&D tax concession are difficult to justify at times. If we were going to take a look at any improvements to the scheme, some of the issues around compliance would be a good place to start.

CHAIR—I do not think there will be any disagreement around the table on that. Just one other clarification: David Michel, you talked about clusters and not being a good use of money. Were you referring to CRCs?

Mr Michel—Yes.

CHAIR—Okay. We figured that was what your reference was, but I just wanted to make sure. Thank you very much for your contributions this morning. We found this roundtable exercise very useful with small and medium businesses. Dealing with the types of companies that you all represent, I think it has also been very valuable for us, as we get towards the report-writing part of this inquiry, to clarify a few things and ideas the committee has had along the way. I really do appreciate the time that you have given us this morning. You are all busy people and some of you have come from interstate. We really appreciate that. We hope to have a report out during the budget session of parliament—May-June—which I am sure you will all be interested in.

Committee adjourned at 10.06 a.m.