



COMMONWEALTH OF AUSTRALIA

## Official Committee Hansard

# HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON ECONOMICS, FINANCE AND  
PUBLIC ADMINISTRATION

**Reference: Australia's manufactured export and import competing base now and  
beyond the resources boom**

THURSDAY, 22 MARCH 2007

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**HOUSE OF REPRESENTATIVES**

**STANDING COMMITTEE ON ECONOMICS, FINANCE AND PUBLIC ADMINISTRATION**

**Thursday, 22 March 2007**

**Members:** Mr Baird (*Chair*), Ms Bird (*Deputy Chair*), Mr Ciobo, Dr Emerson, Ms Grierson, Mr Keenan, Mr McArthur, Mr Secker, Mr Somlyay and Mr Tanner

**Members in attendance:** Mr Baird, Ms Bird, Mr Ciobo, Dr Emerson, Ms Grierson, Mr Keenan, Mr McArthur, Mr Secker, Mr Somlyay

**Terms of reference for the inquiry:**

To inquire into and report on:

The state and future directions of Australia's manufactured export and import competing base, focusing on, but not limited to:

- Australia's dominance in commodities exports and the impacts of this on the economy following the resources boom;
- the state of the country's manufacturing sector (and the goods and associated services) including opportunities and challenges from the expansion in global trade (in particular by China); and
- policies for realising these opportunities.

**WITNESSES**

**HILL, Dr Roderick Jeffrey, Executive Director, Business Development, Commonwealth Scientific and Industrial Research Organisation ..... 1**

**REDDEN, Mr Gregory Ross, Manager, Business Strategy, Commonwealth Scientific and Industrial Research Organisation..... 1**



**Committee met at 9.43 am**

**HILL, Dr Roderick Jeffrey, Executive Director, Business Development, Commonwealth Scientific and Industrial Research Organisation**

**REDDEN, Mr Gregory Ross, Manager, Business Strategy, Commonwealth Scientific and Industrial Research Organisation**

**CHAIR (Mr Baird)**—I declare open this public hearing of the House of Representatives Standing Committee on Economics, Finance and Public Administration. Today's hearing is a continuation of the committee's inquiry into the state of Australia's manufactured export and import competing base now and beyond the resources boom. The inquiry's reference was sent to the committee by the Treasurer, the Hon. Peter Costello, on 3 May 2006. To date, the inquiry has received 47 submissions from a broad cross-section of interested parties in various parts of Australia. Copies of these submissions are available on the committee's website.

I welcome representatives from CSIRO. Although you have not made a submission, the committee has asked you to appear before it because previous witnesses have mentioned your organisation on a number of occasions. You will know that the committee is inquiring into the manufacturing sector and where it will go to post the resources boom—long may it live—focusing particularly on manufacturing within the services sector.

I remind witnesses that, although the committee does not require that evidence be given under oath, this hearing is a legal proceeding of the parliament and warrants the same respect as proceedings of the House itself. We invite you to make a few comments and then we will proceed to questions. I think we have a full roll-up today, which is very encouraging.

**Dr Hill**—Thank you very much for this opportunity. As you know, the CSIRO is a diverse and relatively large organisation, so it makes sense for us to make a very significant contribution to the manufacturing sector in Australia. In the vicinity of \$180 million of our \$1 billion budget is directed towards manufacturing related activities. If the need arises, an additional significant number of dollars can be applied to capability development in manufacturing. So it is a very significant contribution.

We contribute to the manufacturing sector in a number of domains—from large corporates down to small and medium enterprises at various levels. We provide things as simple as advice about where people might go for long-term strategic research and development relationships, spin-outs of companies and so forth. So it is a very broad engagement.

About 12 or 18 months ago—after becoming concerned that in the context of the CSIRO's new science investment process we should understand more completely what we are doing in manufacturing from a whole-of-organisation perspective and make sure those investments are directed to the right areas—we undertook a three-stage process. The first stage was to engage significantly with the external environment to get an idea of where the opportunities and threats in manufacturing arose. The second stage was to look internally and to undertake a robust and comprehensive audit of all the dimensions of our current investment in manufacturing. The third stage was to bring all of that together with a gap analysis and to say, 'Okay, if we should be changing, where should we be changing that investment?' That process has been completed. It is

a work in progress, in the sense that engagement with the divisions and themes of the organisation are continuing and we have been inputting into current deliberations around the new portfolio of investment funding and resources for the 2007-08 financial year's work. So we welcome this opportunity to talk with the committee about that and to tell you what we have been doing.

**CHAIR**—Thank you very much. A number of committee members visited the CSIRO in Newcastle and were impressed by the projects and studies being undertaken, many of which I did not know you were involved in. We have received a series of complaints about the organisation and, as we know in politics, you cannot do anything without attracting critics. As recently as yesterday, a manufacturer from Sydney who understood that we would be speaking to you said, 'The trouble with the CSIRO is that they're only interested in pure research; they're not interested in commercialisation.' That was a recurring theme we heard regarding your lack of commercial focus and application.

Also, when we were talking to Bruck Textiles, Mr Manwaring said, 'We're finding there's a great deal of knowledge within the industry about what they want and there's a great deal of research capability, but there doesn't seem to be this matching. These companies do not know what research is going on.' Mr Van Krieken, speaking for this organisation, said, 'Certainly, we feel that another recommendation from the committee should be to review the process of how research groups are communicating their technologies with industry and perhaps for some research groups to become a bit more aware of what the textiles industry in Australia can do'—talking about one particular industry. That has been a theme.

Mr Manwaring also said, 'As an example of that, CSIRO is actually one of the leading experts in nanotechnology, particularly with textile products. The only problem is that most of the companies they are dealing with are overseas.' He continued, 'They're not even talking to Australian companies to see if this is what we're developing.' That is one of the times that we thought we would call you back. That is general. My colleagues will undoubtedly have other questions that they want to talk to you about. From my point of view, to what extent are you interested in the commercialisation of your products and looking at that, talking to industry and saying, 'What do you see as being appropriate?' To what extent are you led by your own researchers who have a passion about a certain area? The second part is to what extent you just take the technology and sell it off overseas without talking to Australian companies. Perhaps you would like to address that, and I am sure my colleagues have other questions.

**Dr Hill**—It is great to have a very simple question to begin with. There are many dimensions to that question.

**CHAIR**—Yes, that is true.

**Dr Hill**—I am happy to address them and I have written a couple of things down here so that I can address them in turn and perhaps make some sense.

It is said that it is one's failures that civilise one and that one learns little from one's successes. Part of the process in the manufacturing road map was to glean that sort of information from the stakeholders. So it is not new—that information is not new. They are common perceptions of us. But I would just like to add something to the other side of the equation. In terms of

commercialisation, the organisation delivers impacts in a variety of ways. One way of delivering impact—and that is central to our role—is through a direct, identifiable commercialised outcome, a spin-off company or something of that sort. I might add that we have spun off over 60 companies in the past 10 years and the current market cap of those companies is something like \$1.3 billion. So there is a successful history of overt commercialisation in the form of spin-off companies, of which we are happy to provide further details if required.

But that is not the only way we have an impact. We do a huge amount. In fact, the majority of our work is involved in what you might call incremental innovation. We do tactical or strategic collaborative work with industry and the outcome is the transfer of that technology, which disappears, if you like, in some senses into the company. It never sees the light of day or it is not identifiable in the same way as a spin-off company or a licence or a patent might be. That is the vast majority of what we deliver to industry.

The CSIRO always tries to assist where required. We are asked to commercialise technology. In many cases companies do not want assistance from us to commercialise; they just want to go away, taking what we deliver. Hopefully we work in a very collaborative and strategic way and they go away and implement the results because, after all, they are the end user; at the end of the day they are the manufacturer, not the CSIRO.

**CHAIR**—What is the genesis of your research? Do you sit around and brainstorm with ideas that are brought forward by your PhD graduates, do companies come to you and say, ‘We would like some research carried out in this area. We believe this has a lot of potential,’ or is it a combination of both?

**Dr Hill**—It is a combination of both. If anything, the majority is the latter. The CSIRO goes through a very comprehensive process every year to assess the balance of its portfolio.

**Mr SECKER**—I just want to get that right. Are you saying that the majority is industry coming to you and saying that they want to do research on this?

**Dr Hill**—In the more general sense, yes. It may not be industry coming to us directly, but our analysis of the market and opportunities and trying to anticipate where the end use will be or the impact. That drives what we do more than people sitting around in a back room with propellers on their heads thinking up great ideas that no-one can use. That may have been a legitimate criticism many years ago, but that has not been the case for many years in the CSIRO.

**Mr SECKER**—So you are not dominated by people with heads shaped like light bulbs—

**Dr Hill**—Absolutely not, no. We have our fair proportion of those people because, after all, we must be involved in world-class and cutting edge research, and the science has to be terrific and able to compete with opportunities for research overseas.

**CHAIR**—I do not know whether you noticed that last week in Melbourne Dr John Raff, founder of Starpharma Holdings asserted that in recent times the CSIRO competed with industry rather than assisted industry in emerging technologies.

**Ms GRIERSON**—And I get a similar complaint from the university too, that often it is competitive in terms of research rather than collaborative.

**Dr Hill**—We are going through a lot of things at one time. With respect to the collaboration with universities, CSIRO is a partner in 49 of the 65 CRCs. We are very heavily engaged in collaborative research and we are often a major or the major collaborator within the CRC program. Many collaborations are informal or outside the CRC process as well.

**CHAIR**—Obviously these things are floating around about you in the business community.

**Dr Hill**—Yes.

**CHAIR**—Do you think it is probably time to have a road show around to industry, inviting them to come in and talk to you about these issues? Yours is a government funded organisation and it does terrific things, but you are losing a bit of credibility out there in the marketplace, from what we can see.

**Dr Hill**—I think you are absolutely right. In fact, one of the major outcomes from the manufacturing work that we did—what you might call a road-map-type activity—was very strong feedback from industry that in many cases the last thing it needed was more technology. What they wanted was the ability to see how technology could impact upon their business, to understand what was available both in Australia and overseas and how to reach that back into their organisation. They want organisations like the CSIRO to open the doors more to their facilities and to make it more obvious what they are doing and how they can help.

**Ms GRIERSON**—Do you think the flagship approach has impacted? I am from Newcastle where I think the CSIRO's energy flagship and division are doing a wonderful job in trying to engage industry. It has an attitude about its responsibility to build up knowledge and awareness of the importance of gaining efficiencies and the long-term emission targets that we all would have. But do you think that there is not enough emphasis on business engagement? Because the flagships are very much in silos is there a deficit where an equal amount of attention should be given to assisting industry, or is being amongst the flagships enough?

**Dr Hill**—That is a complex question, too. The flagships themselves, as you know, are geared towards major issues of national importance. So it might not be immediately obvious, with the exception of the light metals flagship, that there is a manufacturing connection. But, in fact, in the food futures area and also in the energy transformed flagship there are significant impacts on many of the research programs that directly impact on small-, medium- and large-company manufacturing activities.

We obviously are not communicating well enough. I am getting back to my point about the feedback from the study we did. We have now developed a strategy for going forward that involves a relatively minor proportion of new technology development. A much more significant component of that is the soft parts, if you like, of manufacturing; that is, the parts related to communication, engagement, access to international supply channels, networks, scientific technology and innovation networks and training and development and making our own organisation more open. That is a very strong message that we have heard loud and clear and it is part of our path forward.

**Ms BIRD**—I would like to take this in a different direction. I would like your feedback on the broader question of our inquiry about your experience with regard to where we succeed in Australia in manufacturing. Obviously, we have all agreed that we do not want to be involved in a winners-picking thing. However, somebody said to us that if you get the ingredients right the winners will pick themselves in our economy. That is a good analysis. You are dealing with cutting-edge manufacturing companies all the time, despite some level of complaint. What is your view on where we will be competitive and the sorts of ingredients that you think we should be focusing on to make sure those winners can pick themselves?

**Dr Hill**—The CSIRO's primary role is to make itself available for application of a capability set to industry in various domains, not only manufacturing. We take our guide from industry—through our contacts and so on with the outside—overseas and other parts of Australia about where the emerging sciences and capabilities should be to provide an ongoing platform that will enable Australian manufacturing to be competitive internationally. So that is another dimension to the flagship; that is, what capabilities we need to have to be at that cutting edge.

Obviously, the move is towards niche manufacturing. It is about lower volume activities, which have a higher value-added content. That value-added content is often related to things such as intelligent design, nanotechnology and ICT systems; it is about the services component of manufacturing rather than building a new gear train or something. It is about complex surface treatments that allow things to be more resistant to corrosion. It is also about creep resistant alloys rather than just alloys in general. It is the refinement and the extra dimension associated with things that add real value and Australia not having to rely on large commodity-based activities to be competitive.

We can see that move in spades in Australia at the moment. I do not agree with statements sometimes appearing in the press and elsewhere that manufacturing in Australia is dead. Far from it; I am very optimistic about manufacturing. We have a tendency to focus a little on squeezing the last ounce of efficiency and competitiveness out of our existing products. Perhaps a little more of that effort might go towards some new and innovative areas of niche manufacturing where the value added is higher and where you are not constantly having to drive costs down for your advantage. We have tried to implement that sort of engagement process.

**Ms BIRD**—Is the review which you talk about and which you have done in terms of outlining that a public document? Is that something you could supply to the committee?

**Dr Hill**—It is a working document at the moment. The latest version I have has scribbles from my colleague Greg and me all over it and so on. It is an active working document.

**Ms BIRD**—Is there some sort of time frame in which there might be something?

**Dr Hill**—It will probably never be in a publishable form. It is an internal working document that provides the framework for advice and direction setting within the organisation.

**CHAIR**—What you have to say in terms of the manufacturing sector is important. Would you have a particular look at your evidence about that when it comes back from Hansard and see whether you want to add anything? We will obviously be looking at that in terms of our own—

**Dr Hill**—Perhaps my colleague Greg Redden might have some comments around the niche issues, because he has been responsible for driving the strategy in small and medium enterprises.

**Ms BIRD**—I have talked to the committee about this before. There is a gear manufacturer in my electorate who does mass produced gears and who is now doing extremely well by producing large problem-solving focused gear products, which sounds to me exactly like the sort of thing you are talking about.

**Dr Hill**—Yes.

**Ms BIRD**—I would be interested to hear of your experience with those sorts of companies. Are they looking for help to find how they change from mass production to some specified niche areas?

**Mr Redden**—I think it is fair to say that niche manufacturers, especially the small to medium sized enterprises, have the greatest difficulty in accessing leading edge technology across the world. Of course, the large companies have well established networks. It is part of a strategy which we are developing, which has come out of the work we have already done in manufacturing. The CSIRO is putting in place a specific strategy to try to deliver to the small to medium companies what we believe they need based upon what they have been telling us.

**Ms BIRD**—I suggest in developing that strategy one thing to keep clearly in mind is that they are very time deficient. So whatever the strategy is needs to recognise that to engage them. They must not be frightened off by the amount of time or energy it will take to engage. That is the feedback you get all the time. It is the same with the university sectors.

**Mr Redden**—Yes.

**CHAIR**—Do you want to add anything more, Mr Redden, in terms of your colleague's comments about where he sees manufacturing in the future? Obviously, as a committee we are not so much interested in picking winners. That has proved a problem in the past. However, do you want to add anything else in terms of your sense of where Australia does have real opportunities?

**Mr Redden**—Going into the future, our perception is that the greatest opportunities for growth are for companies that are operating in markets where they are able to identify new high value-added market opportunities for which products can be developed. Typically that is small, agile companies. It ranges, of course, from biomedical and scientific instruments through to many of the equipment and machinery manufacturers associated with what is loosely called Australia's areas of comparative advantage—that is, the processing of natural products and things related to the resources industry. There is a huge number, or a very large number, of small to medium sized companies that are producing or manufacturing—to use the correct word—products for the mining and minerals processing industry.

**Ms BIRD**—Just to follow up in terms of the ingredients, the other thing that comes up is whether we are actually structuring our skills training to match that sort of niche. The example that was brought to me was that of plumbers. There is a growing market of environmentally friendly plumbing systems and water reticulation systems and so on. We actually do not have a

lot of tradesmen trained in that area and there are no real training facilities that do it. So sometimes we get the niche right but we mismatch it with the development of skills. I do not know if you have had experience with that, but I would be interested if you could tell us.

**Dr Hill**—CSIRO, of course, is not a university and does not grant degrees, but we do cosupervise more than 500 masters and PhD students with universities. So we have some significant engagement in that sense, mostly in the application of maybe more fundamental work to proof of concept stage and pilot scale stage. CSIRO has traditionally been the bridge of the fundamental work-to-industry application. It would be difficult for us to talk about our training in the sense that it is not our core business. But we are very happy to see and encourage a whole range of secondments—either mature age industry people coming into CSIRO for periods or our own staff working in industries. That is very common and associated with spin-outs and so forth.

**CHAIR**—Do your staff go overseas as well and have secondments with international research centres?

**Dr Hill**—Absolutely. The contact at conferences in the short term, of course, is very prevalent. We have to do that to keep up with the cutting edge. But there are also many examples of people going overseas for months at a time to work with other research institutions. A colleague of mine recently spent a year at CNRS in Grenoble looking at titanium beach sand processing. That is very relevant to the Australian market.

**CHAIR**—Yes, exactly.

**Mr SECKER**—Can I make the comment that I would have thought that CSIRO would have done a substantial amount of picking winners as part of their process. I think that it is not actually something that we should be scared of, especially if we are getting investment from private enterprise into those areas. You would have to choose which way you are going to go and you would have to choose on the basis of which you think has the best chance of being a commercial success. I just make that comment. You often hear that we should not get involved in picking winners, but I think in this case it is actually just a matter of course that you will have to pick some winners along the way.

There is another thing I was going to ask about. For decades CSIRO has been acknowledged as probably the No. 1 research institute for agricultural areas and primary industry. Is there a shift more towards manufacturing and away from primary industry now or has that just been expanded to take in the whole lot?

**Dr Hill**—We have had two years now of the science investment process. There have been shifts, but it would be unfair to say that there has been a major shift in one direction, either to or away from agriculture. What has happened is that there has been a shift within agriculture to perhaps focusing more on the value-added, downstream, beyond-the-gate type of thing for food and products and so forth and less on ploughing technologies and so forth, if you get my drift. It is the same as in manufacturing. There has been a move away from the commodity base to higher value add. It is the same in the agricultural sector—we are trying to add value. For example, the Food Futures Flagship is directly concerned with how we might add value to foods, taking account of things like the nutritional content and disease prevention aspects rather than just—not that we have abandoned it—increasing the yield from a particular acreage.

**Mr SECKER**—Are you getting any complaints about that sort of shift?

**Dr Hill**—We did get that with the first round of the science and investment process. One does not have to think back to far. All sectors watch the CSIRO very closely and when any move occurs we are subjected to scrutiny. We remember that happening 12 months ago.

**Mr SECKER**—And expanding on what the chair started to ask about—where we are engaging with industry—what are you actually doing to engage with industry? I think that the chair suggested going around almost like a bus tour and that sort of thing. What are you doing to engage with industry? One of the complaints that we get is that they do not join with you as much as they would like to.

**Dr Hill**—I will make some opening comment and then Greg can go ahead, if you wouldn't mind. When we did the audit of our internal capability—and it is matched to the external environment from the industry engagement processes that we went through, which I am sure Greg will describe—we perhaps expected that the investment that we have been making over the last 81 years might have been badly mismatched with industry's needs, and we were concerned that it might have been. But, lo and behold, when we looked at the capability set and how it matched, it had been driven and had been changing year by year, by osmosis or design, and it did in fact match, by and large. We need to overprint on that some refinements, perhaps pre-empt where industry is willing to invest, but by and large the current portfolio has responded, as you might expect, to where industry's needs are. I think that is a sign of the degree to which we engage with industry. There will be examples, as you quoted, Chair, at the beginning of people who have not been able to access us for whatever reason. The capability was not there in CSIRO or it was already tied up with contract work maybe for a period of time and it meant that it was not available at the time of the industry wanting it. We have certainly got a very strong engagement in spite of that with other companies as proof of the fact of our engagement in CRCs and our contractual work with industry.

**Mr Redden**—I was going to make a similar statement except to expand the question. How is it that CSIRO does interact with industry and how is it that CSIRO's research has actually gravitated towards what is more or less needed into the future? I might also say that when we did work to audit CSIRO internally as to what we should or should not be doing, we did that independently of people within the organisation that would have a vested interest in saying, 'Actually my research is the right research because I say so.' Part of my responsibilities in the internal work was to ensure that it was done independently. So we had no vested interest whatsoever in having a bias towards suggesting that particular research which is going on is the right research.

It just turned out that that is the way it is. How is that so? I guess there are two processes. Firstly, people put proposals up within CSIRO to get funding. They do not do this just by dreaming them up in a back room. Many of the members of staff that we have preparing these proposals are also members of industry associations. They have worked with industry or they have spent a lot of time collaborating with industry just to get research projects up in the first place and they understand what is happening overseas. So the quality of the proposals that are put forward within the organisation are already well-informed by industry.

**CHAIR**—I just compare it with Austrade. When they have concentrated on a particular area like the Americas they will bring the trade commissioners out from there and they do a roadshow around Australia, inviting all of the people who export to those countries or who may be interested to come along, and often hundreds come along. In terms of your interchange with industry, do you focus on a particular area—nanotechnology or whatever it might be—and have a program around Australia inviting people in to discuss opportunities and so on?

**Mr Redden**—Let me give you some examples of how we interact. On a broad level of course CSIRO conducts what may loosely be called ‘roadshows’ where industry is invited along for networking kinds of events. On a formalised basis, we have sector advisory committees which represent, in the case of manufacturing, typically CEOs from the manufacturing industry. That ranges both from government representatives from the industry department, for example, and from industry itself. Just thinking back over the years of the people who have been providing advice to us, there have been people from the automotive industry and from the textiles industry—and not the old textiles industry but the very proactive and forward-looking part of the textiles industry that is focusing on technical textiles and very high value-added products. We have had some excellent relationships with some of these people—

**CHAIR**—Could you send us a list of the roadshows: where they have been and what you have been covering? There is a criticism that you guys have not been commercial. We have to get an appreciation of it and we would like to see a bit of the track record of what has happened and what types of people are on your advisory committee. The chances are that we will say, ‘Well done.’ But there will always be people out there who will say, ‘These guys are in back rooms; they don’t care.’ You know what it is like.

**Dr Hill**—We have ideas in advance of that, and we are happy to provide that information. We are in the third year now of the industry roadshow program. They were very significant and well advertised events in all of the major capital cities: Perth, Sydney, Brisbane, Canberra, Adelaide and Melbourne. In the vicinity of 120 to 300 very senior people in the industry go along.

**CHAIR**—So these are not your show and tell, saying, ‘This is what great people we are,’ but are actually interchange—

**Dr Hill**—There is a short period of presentation with some videos about some actual examples of technology that have gone into the industry. Yesterday’s breakfast briefing for parliament had two people from an area in which there has been very significant transfer, for example, in new versions of contact lenses, bone implants and tissue repair stuff. The video is about that sort of thing and where it has been applied. But that is a minor part of the evening. There are sidebar events, with particular themes and divisions organising their own industry group for intimate discussions. Then there are, for about an hour before and afterwards, plenary type discussions over drinks.

**CHAIR**—That sounds good. I am just thinking of the Australian Tourism Exchange, which is a different type of model. It is more like speed dating, if I can use that term. It also seems to be, apart from anything else, the opportunity for somebody, in the confines of a more confidential base, to say ‘Look, I’ve got this product and I want to talk to you about it.’ So we have exploited all opportunities.

**Mr SECKER**—I want to ask about Lucas Heights. We hear how important it is for medical research, but how important is your research there for manufacturing?

**Dr Hill**—We have some engagement with ANSTO. It is primarily around the mineral processing domain. For example, there is a very strong engagement with the collection and disposal of the radioactive residues from the processing of ilmenite for synthetic rutile to turn it into oxide pigment. There has been some other work in remediation. There has also been some contact around ceramics and refractories work for various processes. We have at the moment an ongoing collaboration between the Division of Minerals and ANSTO in relation to finding ways of capturing the benefits of synergies that occur between the new synchrotron in Melbourne and the old and the new reactors at Lucas Heights. So it is an area in which we really want to do much more. Ian Smith and I had a conversation just the other day about how we might make that happen better. There is lots more that we could do that would bring together those two organisations.

**CHAIR**—You wanted to respond to my comment, Mr Redden?

**Mr Redden**—Yes. I was just going to add one more example of a mechanism where CSIRO interacts with industry. An example is that in about two weeks time, with the help of the industry department and sponsored by the Hon. Robert Baldwin, the parliamentary secretary to Ian Macfarlane, we are hosting a forum specifically between the leaders of industry action agendas—so these are the industry leaders—and senior staff within CSIRO. The prime purpose of that forum—and we are conducting them in Sydney and Melbourne to ensure it is practical and easy for industry to attend—is to explore ways in which CSIRO can become even more heavily engaged in industry action agendas and, more importantly, the companies that are leading those industry action agendas.

**CHAIR**—One of the comments that was made in hearings is that CSIRO has not successfully commercialised many products in its own right—that you do joint ventures, if you do any.

**Dr Hill**—Most of the time they are joint, but there are some situations in which we have taken a punt, if you like. You would be aware of the wireless LAN work. That is an area in which we invested ourselves and now that is being actively pursued in terms of the patent rights. There are other examples of where we have gone alone but most of the time it is very strongly in collaboration with the end user, which is as it should be, in our view.

**Mr CIOBO**—Thank you for your testimony. It has been most illuminating. You mentioned about \$1.3 billion worth of spin-out as a result of CSIRO and perhaps collaborative research. Do you have a standard procedure with respect to who retains IP for that? Does the Commonwealth retain IP or does IP go to the commercialising entity? Is there a pro forma with regard to that? I have a broader and more general question with respect to the relationship that CSIRO has with venture capitalists and the way in which you might actually go about that commercialisation process. Are there formal routes that you follow or is it a case of shopping it out to the highest bidder? I am interested in that process.

**Dr Hill**—The particular circumstance of the end user, the background intellectual property that we bring and our role in the final commercialisation uptake process differs from deal to deal. They need to be and are considered on their own merits. By and large, it is true that, if it is a true

spin-out and it is mostly IP generated by CSIRO, we would expect to have a share of the equity. That equity would be in proportion to the value of the work that we had done previously and to the amount of effort that is going forward of that following spin-out to bring the particular technology to market. It is not formulaic but there are various principles around what your input has been and what the value of the output is going to be. Then there is negotiation around what that share should be.

**Mr CIOBO**—I would have thought that that would have been a fairly significant revenue earner for CSIRO over the years. Has it been?

**Dr Hill**—I think it is a matter of public record that external revenue from commercialisation, specifically in terms of licences or royalties and equity sales, is of the order of \$40 million per annum.

**Mr CIOBO**—That does not seem like much.

**Dr Hill**—I do not know what sources you have for saying that it is not much, but it is a rare university that gets more than three or four per cent, averaged over time. One hears about the big wins—the things that keep people involved—the once-in-30-year type wins like the Massachusetts Institute of Technology and so on. But, averaged over time, that is about what one might expect.

**Mr CIOBO**—Is CSIRO required to take into account a desire to retain IP in Australia or is that not part of your direction?

**Dr Hill**—Wherever possible, the impact that CSIRO delivers is directed towards a benefit for Australia. We protect that in whatever way we can.

**Mr CIOBO**—With respect to then your links with venture capitalists, how does that work? The impression I am left with in regard to commercialisation is that it is largely a bit of a hit-and-miss affair. I know that in Sydney, for example, there is the Australian Technology Park; a number of state based commercialisation/research precincts; and, of course, you have incubator program through AusIndustry. We run the COMET grants program. I am left with the overall impression that it is all a little bit haphazard. Is that your experience as one of the leading organisations when it comes to commercialisation in the country? Is there a set annual expo? How does that all work?

**Dr Hill**—Far from it. We have a very robust and appropriately governed process within the organisation—

**Mr CIOBO**—You might, but I am talking about the marketplace generally.

**Dr Hill**—I prefer not to speak about the marketplace generally, if that is okay. I thought the question was related to whether we have processes in-house for managing or is it ad hoc. We do have a process for managing the commercialisation. We have a commercialisation group within the organisation. It has clearly defined roles and accountabilities. We have a process of commercial executive committee, which is a precursor to the CSIRO board commercial

committee. Things have to pass by those various filters and appropriate governance arrangements before we go into a deal.

In terms of venture capitalists, let me give you an example, perhaps, of some direct experience I had when I was chief of the Division of Minerals. We chose then to spin out some particular technology in relation to mineral characterisation work with a very strong impact on processing efficiencies and assessment of ore deposits and so on. That was spun out as a company called Intellection. It was an internally funded spin-out arrangement. It was totally funded by CSIRO, but we chose to undertake a capital raising. We interacted in a very open and transparent way with the venture capital community to raise funds and we did raise funds for that.

Five staff in the company transferred when it was spun out of CSIRO. I think three years later it is now 65 staff, operating very successfully in a suburb of Brisbane. That is a mixture of both the CSIRO internal spin-out, wholly owned type model supplemented later, as it became appropriate in the marketplace, by a venture capital injection of funding.

**Mr CIOBO**—I would like to press you on your observations of the market because obviously this is a fundamental part of Australia's success going forwards and, as one of the leading players in the marketplace, I am interested in your impressions. It is not an implicit observation that anything untoward is happening. I am just interested in whether the market is haphazard when it comes to demand and supply to those who are wanting to invest and those who are coming up with services and manufacturing process and all these things to invest in—those who are coming up with the products and the services—whether it is the universities or incubators or CSIRO or someone in his back shed. I am interested in your views on how well that market is functioning.

**Dr Hill**—I would have to preface these comments by saying that the commercial sector and venture capital and arrangements for commercialising in the marketplace is not one of my areas of expertise. So I defer to my colleague, Mr Poole, who heads up the commercial group, for that sort of detail. However, I think it makes sense in a pluralist society like CSIRO to have a variety of commercialisation platforms and channels. It will be at one end the research institution doing it; in other cases it will be a formalised commercial group identified, like in a university, doing that. In other cases it will be purely the private sector, scanning the horizon and making bids. I think that is a healthy environment to have those different opportunities. It may look chaotic but I think at the end of the day the market decides what it wants to do, very effectively.

**Ms BIRD**—Subsequent to this meeting, would you be able to send me a brief on what CSIRO's involvement is in Wollongong and the Illawarra—my area? I am not familiar with your presence there—if there is a presence there; I don't know. I would appreciate it if you could do that.

**Dr Hill**—Just to clarify, specifically in relation to manufacturing, or CSIRO in general?

**Ms BIRD**—In general. The reason I say that is often we are, as members, the first port of call for small and medium businesses who say, 'I am at this point where I know I can take off, but what on earth is going to happen next?' It is useful for members of parliament to have that understanding of what is available in the area. In terms of further developing your program of interaction—we get them from private health and places like that—electorate-specific one-page

summaries of the organisation's involvement would be a tremendous asset to members of parliament in engaging with their own business communities. I would personally appreciate that, and invite you to take on that suggestion.

**Mr CIOBO**—Is there a formalised relationship between CSIRO and the department of industry with respect to, for example, COMET grants? They get tens of thousands of applications for COMET grants, both successful and unsuccessful. Is there any formal referral process as to whether you could value-add with respect to COMET grants, or do they run separately? Is there any relationship there?

**Dr Hill**—My understanding is that there is no formal arrangement with respect to CSIRO's engagement with the COMET program.

**Mr CIOBO**—I would have thought that was probably a fairly obvious area to have some collaborative approach on. People are applying for commercialisation grants. I would have thought that there would be a mine rich seam running through the applicants that CSIRO could perhaps value-add to, and vice versa.

**Mr Redden**—When we look at all of the grants administered by AusIndustry, there is no special relationship that CSIRO has in that process of obtaining grants with AusIndustry. I think it is fair to say, though, that CSIRO is looking at ways in which we can more effectively work with industry, especially SMEs, I might add, who often depend upon commercial-ready and COMET grants and the like.

**CHAIR**—Is it because you work more with larger organisations that can fund the research? If you did a review of the companies that you work with, what majority would have over 100 members of staff, for example?

**Mr Redden**—I would need to look up the statistics we have collated on that.

**CHAIR**—Roughly?

**Mr Redden**—Roughly speaking, I think it would be a third small, a third medium and a third large. If we look at it from a financial perspective, the income which CSIRO gets and its access to resources is larger with the large companies because they have the ability to fund research. The actual relationships we have, however, are roughly speaking relatively even. Some people think that CSIRO is abandoning the small end of town. That is not true. We are always looking for ways in which we can somehow resource those relationships better.

**CHAIR**—Thank you very much for coming today. It helped clarify some of our views on this issue. Could you send us some of the papers we have been talking about and maybe also a list of the commercialised companies that you have set up? I think you said there were 60 that you had been involved in on product development, with a commercial capitalisation of \$2 billion, was it?

**Dr Hill**—\$1.3 billion.

**CHAIR**—A listing of those would be interesting for us. Thank you very much. We really appreciate you coming.

Resolved (on motion by **Ms Bird**):

That this committee authorises publication, including publication on the parliamentary database, of the transcript of the evidence given before it at public hearing this day.

**Committee adjourned at 10.31 am**