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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON INDUSTRY, SCIENCE AND RESOURCES

Reference: Increasing the value-adding to Australian raw materials

MONDAY, 16 OCTOBER 2000

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STANDING COMMITTEE ON INDUSTRY, SCIENCE AND RESOURCES

Monday, 16 October 2000

Members: Mr Prosser *(Chair)*, Mr Brough, Mr Hatton, Mr Lloyd, Mr Ian Macfarlane, Mr Allan Morris, Mr Nairn, Ms Roxon, Mr Thompson, Dr Washer and Mr Zahra

Members in attendance: Mr Ian Macfarlane, Mr Allan Morris, Mr Prosser, Ms Roxon and Dr Washer

Terms of reference for the inquiry:

To inquire into and report on the prospects of increasing value-adding to Australian raw materials. The Committee will start with an evaluation of the current state of value adding in Australia, and how that compares internationally. This will provide a base from which to evaluate the following topics:

- incentives and impediments to investment;
- intellectual property rights;
- national/international marketing factors which may encourage or hinder Australian value-adding;
- government intervention, both nationally and internationally;
- the location of value-adding industries and projects in regional Australia;
- resource licensing/permit arrangements;
- the impact of vertical integration within particular industries; and
- the Australian skills base and any associated impediments.

WITNESSES

Committee met at 9.05 a.m.

DUNLOP, Professor Gordon, Chief Executive Officer, CRC for Cast Metals Manufacturing

CHAIR—I declare the meeting open and welcome you. I remind you that the proceedings here today are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The deliberate misleading of the committee may be regarded as a contempt of the parliament. The committee prefers that all evidence be given in public, but should you at any stage wish to give evidence in private you may ask to do so and the committee will give consideration to your request. Would you like to make an opening statement?

Prof. Dunlop—Firstly, thank you very much for this opportunity to talk to you. I think that this is an extremely important issue for Australia and for the country's future wellbeing. As I said earlier, I am the CEO of CAST, which is a joint venture between one aluminium producer, one potential magnesium producer, die-casting companies, the Australian Die Casting Association, the Queensland and Victorian state governments and research institutes, including the CSIRO and the Queensland Manufacturing Institute and a number of universities.

The purpose of the centre is to develop and implement technologies that will increase the global competitiveness of the Australian light metals industry. Australia has a very mature aluminium industry. It produces seven per cent of the world's production of aluminium metal. In fact, aluminium and alumina combined are Australia's third largest export industry, worth $5.5 billion per year. Downstream of the aluminium industry we have a small aluminium fabrication and manufacturing industry. It is not really something to boast of. Potentially we will be a very important player in the world's magnesium industry. For example, the plans that the Australian Magnesium Corporation have for the production of magnesium at Stanwell outside Rockhampton are for a production plant which would have a capacity one quarter of the current world production of magnesium. That is a very large statistic.

The main growth for both aluminium and magnesium is in the automotive industry. That is where the main opportunities are for sale of those two metals and for adding value to them. The automotive market is driven by the need to reduce fuel consumption—a very topical issue right now—and also to reduce exhaust emissions. This is accomplished by decreasing vehicle weight. Of course, there are many other ways of decreasing those two things, but vehicle weight is one of the major issues. There are other opportunities in mass transport and in other consumer industries, such as portable electronics.

I have provided you with a paper which I wrote a few months ago. It was written for another purpose, but I think it is very topical for your consideration now. In that paper I talk about the opportunities for adding value being stimulated by strategic alliances between metal producers and other companies in the value adding chain. I think this is a very important way of stimulating both markets for metal and the adding of value to that metal. I can provide you with two examples—and there are many—from our own experience in CAST.

Firstly, we work very closely with the Australian Magnesium Corporation. It has an alliance with VAW, which is Europe's largest aluminium engine block manufacturer. We are working with AMC, VAW—a German company—and another company in the UK to develop a

magnesium alloy which will be suitable for car engine blocks. It is a very significant task but, if this succeeds, the market for magnesium has the potential to grow very significantly and this new alloy would be a significant added value product for the Australian Magnesium Corporation.

The main requirement here is to develop a high temperature, creep resistant—that is, deformation resistant—alloy at high temperatures—the temperature of operation of the engine—which would be suitable for automobiles. There are cost factors, mechanical properties and corrosion issues concerned with the coolant of the engine. There are a number of groups around the world working on this. Our focus is very much driven by the end user, which in this case is VAW, but its end users are its collaborators in the automobile manufacturing companies. That is one example which I feel has the potential to add considerably to value added product from Australia.

Another example is that we are working with a major Australian automotive component manufacturer. This manufacturer is major for Australia but is small on the world scene. It is a specialist company. It has a very strong profile in the niche that it is in. It wishes to apply magnesium in its product. There are some technical issues related to design, alloy development and the utilisation of magnesium in a situation where it has not been used previously. We are working closely with it to do that. There are numerous examples. In my paper I have talked about some examples from the aluminium industry, albeit not in Australia. The question I would ask is: how are we to stimulate this kind of activity? I can carry on with some suggestions, but you might have some questions of me.

CHAIR—Thank you very much for that. I would like to open the batting. You mentioned engine blocks and the corrosion of the cooling systems. I recall in the very early days that corrosion was a big problem with aluminium heads. When the first flood of Japanese cars came to Australia, in certain parts of Australia the water that we put in the radiator just destroyed the heads in no time flat. Are they the sorts of problems that you are wanting to address?

Prof. Dunlop—Exactly. The way around it is through adjusting the chemistry of the coolant but also adjusting the chemistry of the alloy.

CHAIR—You have obviously dealt with a number of companies throughout the light metals area. What do you see as the main impediments to more downstream processing in Australia?

Prof. Dunlop—I think there are two things. One is very much cultural—the Australian culture and the business culture in this country. The other is—

CHAIR—By that, do you mean ‘dig it out of the ground, whack it on a ship and the job is done’?

Prof. Dunlop—Yes. I think we have to recognise that. Also, we have seen attempts by one of Australia’s major aluminium companies to actually go into downstream manufacture in the automotive industry only to see them eventually pull out. My reading of the situation is that they did not have the culture within the company in order to deal with the issues of manufacturing.

Ms ROXON—On that same topic, I was interested when you were saying that you have some ideas about how we could stimulate more activity. I am sure other committee members would also be interested to hear how you think we can do that, particularly what role government public policy can play and what role the business community really has to take on that we might be able to encourage in some way. Spending a little bit of time on that, from my point of view, would be very helpful.

Prof. Dunlop—I think it is very much a matter of encouragement and enticement. There are a number of issues. One is that the Australian car industry has no restrictions on it with respect to fuel consumption such as have been experienced in North America or in Europe. In North America they have the CAFE—corporate average fuel economy—regulations which are having a significant influence on the efficiency of motor cars and their emissions. One of the methods for keeping cars below this limiting fuel consumption which is applied by those regulations is to decrease their weight. Australia does not do that and I think it is a pity.

One reason is that, if the Australian component supply industry had to supply components to the car industry which had a weight factor in there, it would become more competitive on the world stage. If you think of the overall car, it is the power to weight ratio, but the automotive industry is made up of a whole range of supply companies, and the car companies in the end assemble. It is really that supply industry which is Australia's export industry in the automotive area. I think if their home customer is demanding on weight, as the rest of the world is coming to do, then that supply industry would become more focused on weight problems and become more competitive on the world stage.

CHAIR—The current price of fuel in Australia may well—

Prof. Dunlop—It may well drive things in that direction. The core Australian automotive manufacturers will readily admit that they have a weight problem in their products, but they are not doing a lot about it. So that is one area I think where a government can look at ways of encouraging, enticing or forcing the Australian car industry to become more fuel efficient. Another idea would be to provide special R&D assistance to encourage metal producers to work with both Australian manufacturers and overseas manufacturers in the area of added value. An area which would be of special advantage would be to encourage alliances, with the help of R&D assistance, with overseas manufacturers who are considering investing in production facilities in Australia. Finally, and it is linked, we need special incentives such as assistance with risk capital to encourage the investment in value-adding industries in Australia. One of the major problems is getting hands on risk capital.

Mr IAN MACFARLANE—In terms of detail, what sorts of initiatives, incentives or inducements do you see as being necessary? I think we all accept that that would be a great outcome. How do you make it happen?

Prof. Dunlop—I think it has to be very targeted. The current R&D assistance schemes for industry are not targeted in that way. They are very focused on start-up companies. The R&D Start scheme, for example, is focused on start-up companies. I just think that things need to be very targeted to—

Mr IAN MACFARLANE—I am still none the wiser. What specific sort of program should we put in place to bring about a greater emphasis on this leading-edge metallurgy and the R&D that develops it?

Prof. Dunlop—It is not just metallurgy; it is a combination of metallurgy and mechanical engineering to a large extent but, more importantly, it is the business aspect of it. We need schemes which target strategic alliances between metal producers and downstream manufacturers. I do not believe the metal producers are going to get into manufacturing again. I think that they are going to stay out of that. But the production of alloy in appropriate forms for manufacturing is a significant added value product. Most of the aluminium produced in Australia—70-plus per cent of it—is exported in the raw, unalloyed form in ingots which are subsequently melted and alloyed in overseas production facilities.

Mr IAN MACFARLANE—I am sorry to persist, but you have not given me any insight into what we should be doing. Let me try it from this angle: what are the impediments that are stopping that happening now?

Prof. Dunlop—It is costly and risky to do the development which is necessary. There are impediments for investment, or should I say it is easier to invest in other places.

Mr IAN MACFARLANE—What are the impediments to invest?

Prof. Dunlop—The impediments are the difficulties in raising risk capital to do the development work. There are impediments to investment because of location, price, cost of labour and all the rest of it. There is a whole range of issues here.

Mr IAN MACFARLANE—I am not sure we can do a lot about the location and a few of the other factors. However, in terms of raising the risk capital, are you asking for a greater write-off in terms of tax?

Prof. Dunlop—Sure.

Mr IAN MACFARLANE—At what level?

Prof. Dunlop—I do not think I am in a position to make those suggestions. I am not an expert in that area, but I understand well and truly that it is very difficult to raise that sort of money—extremely difficult.

Mr ALLAN MORRIS—Professor, there are two strands to what CRC is doing. One is that alloys are being mixed together with certain things and then there is the actual conversion into products. In subsequently reading that, I noticed that, while most stuff is casting, extrusion is also starting to come into magnesium, particularly magnesium alloys and so on. Can you explain that technically? What is involved and where is that going to? It seems that if that happens more there will be a much wider range of products available.

Prof. Dunlop—I think magnesium is at a very early stage of its development as a structural metal. The current markets for magnesium are very dominated by die-casting. That is partly because the existing die-casting alloys are extremely suitable for that process. But there is a

whole other range of fabrication and manufacturing processes such as extrusion, rolling and sheet forming which have not been developed for magnesium. They exist in a very small and, I would say, primitive way. I believe there are significant markets for the future in that area. That is very much in the future. It is not at our doorstep right now. We are talking about five or 10-plus years away. The immediate markets for magnesium in automotive and associated industries are in die-casting alloys.

Mr ALLAN MORRIS—But isn't one of our potential advantages from CRC's point of view and Australia's point of view that if you are developing new uses that would give leadership? Potentially, that gives you some international recognition for that. In amongst that, things like weldability would be important, as would durability—

Prof. Dunlop—Absolutely.

Mr ALLAN MORRIS—Does that relate back to content or are all magnesium alloys weldable? I am trying to get a fix on whether there are intrinsic problems with that direction.

Prof. Dunlop—One of the biggest problems in the application of magnesium is its high degree of chemical reactivity, which leads to galvanic corrosion problems. The joining of magnesium to other metals such as steel produces a galvanic cell which encourages corrosion of the magnesium—it becomes sacrificial in that galvanic cell. Ways of overcoming that are of prime importance in its application.

Dr WASHER—Professor, I want to pick up the thread of one of the suggestions you made. I guess strategic alliances would be one of the themes you are talking about because of our failure historically with at least one big aluminium producing company to become a manufacturer successfully. There are obviously examples of strategic alliances already in your group. Are they working out as well as you had anticipated?

Prof. Dunlop—They have considerably more potential than anything else. It provides a direction for the work. One of the problems of a metal producer developing an alloy and a product which it is going to sell to a manufacturer is doing it in isolation and producing something which the market does not really want. If you do that together with a downstream user of that product, then you will have a far better chance of hitting the target.

CHAIR—Your association with Ford should drive that, shouldn't it?

Prof. Dunlop— Yes.

Dr WASHER—I also want to move to a different subject—that is, greenhouse gases. I think we are back to the Kyoto talks again shortly. Do you have any suggestions on that?

Prof. Dunlop—There are some very significant issues here for Australia, and I do not have to tell you that. Firstly, the source of our energy used to produce these metals produces quite a lot of CO_2. That will become an issue for Australia. In magnesium production and usage, there is a need to protect the melt from oxidation and catching fire in the atmosphere. Over the last 20 years the industry has used mixtures of a gas, sulfur hexafluride, with dry air and CO_2. That sulfur hexafluride is the worst greenhouse gas known to man. It has a global warming potential

24,000 times that of CO_2. We recognised the importance of this two or three years ago. Working together with AMC, we have invented a replacement gas for that which has about 20 times less effect on the greenhouse. If that were implemented globally, that would reduce equivalent CO_2 production by five million tonnes or six million tonnes.

CHAIR—Would it be your view that you would urge the government to renegotiate the Kyoto credit system so that cars emit less emissions because of the lighter alloys and that sort of thing and so we gain the credits? As you are aware—I think this is in your paper—we do not get the credits for the downstream processing. Where other countries get the credits, we do not. So we are on a hiding to nothing.

Prof. Dunlop—I do not think the Kyoto agreement as it now stands is very advantageous for Australia at all. If that can be negotiated, then well and good. I think it might be difficult.

CHAIR—I think you are right.

Mr ALLAN MORRIS—We are aware that one of the reasons AMC went ahead with its research was the reluctance of American patent holders to produce in Australia. Am I right?

Prof. Dunlop—I think you should ask AMC those questions.

Mr ALLAN MORRIS—Just put that aside; I want to come to something else. The implication of that is that intellectual property rights are very powerful and can have a substantial effect on development. Firstly, I would have thought there is a complaint for our industries and our investors because of that. On the other side of the coin, is the intellectual property you are developing as safe as that which we cannot use? In other words, are you going to be able to prevent other countries or other companies from developing products or mixes or technology that you develop but for which you hold intellectual property rights? Do our competitors enforce the intellectual property regimes as well as we do?

Prof. Dunlop—I think the Australian situation is no different from anywhere else in the world with respect to protection of intellectual property. We can do our best to protect, in the same way that people in the United States or elsewhere can. The issue is more growing markets and ensuring that Australia gets its share of a growing market. For magnesium, I think it is more important for Australian producers to grow the world market and have an active place in that world market than it is to maintain a situation of being the sole producer of a particular product.

Mr ALLAN MORRIS—You are talking there about the raw material and the first level of production. I am actually thinking more downstream.

Prof. Dunlop—I was actually thinking downstream, too. An example is a new alloy for a car engine. While having a preferred position in terms of timing and level of royalties that you pay on such an alloy, you really want that alloy to become used universally in the world. The car manufacturers want to have more than one potential supplier of metal and you do not want a situation where one car manufacturer is using one alloy developed and produced in Australia and another car manufacturer is using another alloy. You really want universality and total growth of the market.

Mr ALLAN MORRIS—Therefore, shouldn't we only invest in content rather than shape and form? What you are saying is that, so long as we are getting products out there, we are then developing our magnesite and magnesium and getting it into that supply. I am asking about the casting and extrusion technology, which I was trying to get to. If we cannot hold the line on those, then should we bother trying to compete with them? Should we not stick, then, simply with the metal mixtures—the alloy types and so on—rather than with the actual application of the alloys?

Prof. Dunlop—I think I would argue that it is important to compete on all fronts and it is important to maintain what leading edge you can. I think it is continual competition. You need to be continually in front of or up with the opposition.

Mr ALLAN MORRIS—What the investors who look at this tend to say is that there is not much point developing a technology in Australia other than at the rudimentary levels—the actual alloy levels—because we will just get knocked off anyway. The Japanese or the Chinese or the Europeans or the Americans will just go and do it anyway and we cannot fight them. Therefore, it is a bad place to invest in because we do not have the mass and the government does not seem much involved in protecting patents of any type. So the capacity to defend and protect a patent from another country seems to be pretty minimal if you are an Australian company.

Prof. Dunlop—I think the difficulty for an Australian company in defending intellectual property is not particularly different from anywhere else. It depends how much financial might you have. I think the important issue of strategic alliances between Australian producers and major consumers becomes even more important in this regard.

Mr ALLAN MORRIS—Unless Ford does it, don't bother. Going slightly further, there has been a suggestion over the years from some countries—I think perhaps the French may be doing it—that governments should be prepared if need be, particularly in some of the key areas, to defend patents registered in their country; that governments should recognise patents as being part of the wealth of the nation or the actual resources of a country and should be prepared to defend those patents if there is blatant patent breach taking place, if the companies themselves are unable to. From recollection, I think the French do that now. Their listing of patents has gone up quite dramatically over the last 15 or so years. It has been raised in Australia a few times, but we have never discussed it very seriously.

Prof. Dunlop—No, and I must say that I have not been part of such a discussion. I do not feel capable of—

Mr ALLAN MORRIS—I am just concerned. At the moment, for example, we have put a lot of money into Hismelt, HBI, and into CRCs like yourselves. Yet at the end of all that, the reliance on the property developed may be dependent on a very tiny company with no capacity. So one says: should we not understand the fuller picture? Is there a picture that we do not understand that we are not really addressing—that is, having got the intellectual property, do we leave it for a tiny company to actually defend it in, say, the American, Japanese or Chinese marketplace? The American government came in on the Howe leather issue. And who got involved with steel? The American government!

Prof. Dunlop—The leather issue I do not think was an intellectual property issue.

Mr ALLAN MORRIS—But the issue becomes a government issue, not simply a company issue.

Prof. Dunlop—But I think the real thing is governmental support on all fronts for an industry which is vital to the country.

Mr ALLAN MORRIS—But there is no support on the patent front, is there?

CHAIR—I think what Allan was suggesting is governmental action, more than support.

Mr ALLAN MORRIS—There is no support on the patent front, though. If someone has a patent, it is a private matter; it is nothing to do with the country. But the country may have invested squillions in that person getting that patent. What I guess I was trying to canvass is that adding value to resources usually involves intellectual property of some form and the best form is to have indigenous intellectual property. Having done all that, it seems as though the government says that its responsibility stops at that. It may spend an awful lot of money on getting to that point but will spend nothing beyond that point to make sure it actually—

Prof. Dunlop—I cannot disagree with you. I think you are right. For key items of intellectual property it would be extremely—

Mr ALLAN MORRIS—So if you develop a really good extrusion technology or a casting technology—forget the alloy; that is separate, it is a mixture—for magnesium, for example, which was ahead of its time and which would make magnesium much more applicable and much more useable, particularly, say, for IT or communications components, as soon as it is in the marketplace someone just goes and copies it.

Prof. Dunlop—Certainly CRC would be unable to defend it very strongly and very likely the companies we are working with would be unable to defend it very strongly.

Dr WASHER—Just following up on Allan's remarks there, I would have thought the greatest intellectual property we have is in people's heads, and that is the thing we cannot patent. Our current tragedy is that we have an exodus of people with this property in their heads—well-educated, well-trained people from this country. So I would imagine—and this is the question—that having the right research and business environment in this country would be the best way of stopping that loss.

Prof. Dunlop—I think you are right.

Dr WASHER—That is what we have to work towards. That is the issue. How governments motivate that environment now is a questionable problem. Just to come back to your tax incentive, I have always advocated that myself, historically, but, as you say, it needs to be very focused and it is the focus and how we get that, I think, that is going to be the major question. I think Ian mentioned that and I think you will agree that that is the difficult issue.

Ms ROXON—I am just interested in the fact that this committee has heard a fair bit of criticism in varying degrees about the changes to the research and development tax concessions. I just wondered from your position whether you can give us any feedback of the sort of impact that this reduction might have had in the light metals sector. Presumably, you see and deal with companies that are involved with the CRC making decisions about investing in longer term or riskier sorts of projects. Do you have any views that you could put to us about that and perhaps any information about the impact that it has had?

Prof. Dunlop—It is very qualitative, but it certainly is having an influence on the amount of money being spent by companies large and small in R&D. There is no doubt about that. By 'small' I mean companies with a turnover of less than $100 million a year—just a medium-sized company. But the extremely small—those of a start-up character—where we are getting to turnovers of, say, less than $10 million a year I think are reasonably well catered for by the start grants which are targeted in terms of product process development for companies with growth potential, but I think the spending by companies above that level is way, way down, primarily because of the tax.

CHAIR—Do you think results have changed all that much, though—the outcomes?

Prof. Dunlop—I think so. But, again, that is qualified.

Mr IAN MACFARLANE—In terms of our position on greenhouse gas, for an industry that relies so heavily on base load coal-fired power stations, where do you see that impacting or how do you see that impacting? We just had a very, some might say, political decision not to build a base load power station at Kogan Creek west of Toowoomba in favour of a gas-fired power station at Ipswich. Those sorts of decisions are going to become more prevalent. How does the alloy industry in Australia, particularly the aluminium industry, remain internationally competitive in that environment?

Prof. Dunlop—Again, I would say this is not my expertise and I would suggest that you talk to that industry, but there is no doubt that the production of light metals, aluminium and magnesium, is very largely determined by the price of energy and eventually the consumers of those light metals are going to be concerned about the environmental impact of that energy. We see signs of this already in the end use market for aluminium and magnesium. The car companies are doing life cycle analyses of various materials from different origins to determine the overall impact of using those materials in their products and, while we have not so far seen any direct effect in the market of magnesium produced with coal-fired energy in comparison to magnesium produced with hydroelectric energy, I think at some stage in the not too distant future there will be effects like that and so the diversification of energy supply to cleaner supply—that is, replacing coal with gas—I think is strategically quite important for Australia.

Mr IAN MACFARLANE—In terms of the coal industry, they are currently investigating how they can lower their CO_2 emissions through new methods of burning coal. Do you see an opportunity there for the CRC to perhaps get involved in some joint research, because if they are unable to achieve an acceptable level of CO_2 emissions your industry is going to be under a lot of pressure here in Queensland.

Prof. Dunlop—The way we are presently structured, I do not think it is in our remit to do that. I think we are the wrong people to be doing that. We do not have the expertise for that. There is a CRC for Black Coal Utilisation which I think is far better positioned to work on those problems.

Mr ALLAN MORRIS—Just a couple of things, if we have the time. Firstly, on the price of magnesium, was that a price ratio between 1.4 and 2 or so, magnesium versus aluminium, but with the suggestion that we may end up with very large plants and so on? How much do you see that gap coming back to eventually? What is your thinking in terms of what you are looking at of usage of magnesium in alloys? You must have some idea of price differentials in the longer term.

Prof. Dunlop—The price of the metal is a major impediment to the growth of the market. I think there is no doubt that price will come down and that cost of production will come down. We have seen this in the aluminium industry over the last 50 years; the cost of production has come down enormously. I think at the moment the magnesium industry is at a very early stage of development. If you compare it with aluminium, aluminium has one process used world wide for going from bauxite to alumina—the Bayer process—and one process going from alumina to aluminium metal and then we just see engineering differences, but the process is essentially the same. In magnesium, there are half a dozen different raw materials, whereas aluminium only has one—that is bauxite—and there is a plethora of different routes to the final product and it has not shaken out. We have seen one or two high cost producers fall by the wayside but no doubt there are more to fall by the wayside as lower cost producers come on stream.

Mr ALLAN MORRIS—In 10 years time, will its price relative to aluminium be 1.4, 1.2 or 1.7?

Prof. Dunlop—It will be less than it is now.

Mr ALLAN MORRIS—The second thing, if I can be brief, is about geography. You obviously see, and I very much agree with you, the potential for a die-casting light metal industry in Australia, whether it be in casting, extrusion or whatever. Do you take the mountain to Mohammed or vice versa? Where do those things fit in the economic and geographical structures—next to the smelters, near the power, near the market, near the shipping to export them? Where do you actually locate those—

Prof. Dunlop—All those factors are important and it is a matter of getting the cost down as low as possible, but if we are considering a large scale magnesium automotive casting plant, for example, supply of hot metal is an advantage and the ability to use facilities of the smelter for the recycling of in-plant scrap is also a useful factor. Magnesium, while it is recyclable, is not as easily recyclable as aluminium in that it does require some careful processing. That is very conveniently done in the cast house of a smelter. In fact, two of the major recyclers of magnesium are the Norsk Hydro plant in Norway and the Norsk Hydro plant in North America—in Quebec. So they are trucking in the scrap that is generated in casting to the original smelter for recycling and bleeding into primary product.

Mr ALLAN MORRIS—Can I just ask, Professor Dunlop, that if you have any further thoughts on intellectual property protection, given that you—

Prof. Dunlop—It was new to me.

Mr ALLAN MORRIS—If you have any thoughts that you want to pass on, I would be grateful.

Prof. Dunlop—Sure.

Mr ALLAN MORRIS—If you do not, that is fine, but if you have any ideas, particularly where you are with relatively small companies, in a small CRC, if you develop something really special, then how can we devise ways for you to better protect that in some form? If you have any thoughts—and just thoughts; it does not have to be—

Prof. Dunlop—Sure.

Mr ALLAN MORRIS—I would be grateful.

CHAIR—We are running out of time. Before we conclude, Professor Dunlop sent us his paper titled *Creating a Future for Australia's Light Metals Through Vertical Integration*. It has been resolved that that document will become a committee exhibit. Professor, thank you very much for your very informative evidence this morning.

[9.55 a.m.]

HOWARD-SMITH, Mr Ian Harry, Managing Director, Tek Services Pty Ltd; and Australian/Asian Representative, Teksid SpA

CHAIR—Welcome. Mr Howard-Smith, I remind you that the proceedings here today are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The deliberate misleading of the committee may be regarded as a contempt of the parliament. The committee prefers that all evidence be given in public, but should you wish at any stage to give evidence in private, you may request to do so and the committee will give consideration to your request. I would like you, if you wish, to make an opening presentation to the committee.

Mr Howard-Smith—Teksid appreciates the opportunity to address the committee. Perhaps I could just briefly outline the Teksid group. Teksid is two-thirds owned by Fiat, one third owned by Renault and, as a die-casting group in aluminium, magnesium and cast iron, it is the largest in the world, particularly in the automotive arena, although there is a very large business in aviation and aerospace.

In a previous life, if I can put it that way, I was the managing director of Queensland Metals, which is now Australian Magnesium Corporation. QMC and Teksid Fiat developed a very good relationship some five or six years ago. When I left QMC in 1997, it was essentially to join with Fiat and Teksid in seeing if it was commercially realistic, commercially feasible, to actually establish light metal die-casting in Australia. My personal love—again for want of a better word—is magnesium, but aluminium is also a quite wonderful lightweight metal. So we have been looking around—when I say 'we', I mean Teksid and my company—evaluating various possibilities in Australia as a whole for the last few years. We are still doing so. The prospects in the future we would not class as bright, but they are certainly not dim. There is the chance of establishing a significant die-casting capacity here. Really, the reason I am here is to throw myself open and see if I can answer any of your questions on that.

CHAIR—How close is Teksid to its decision on downstream processing?

Mr Howard-Smith—That is a difficult one to answer. With a major die-caster as distinct from a small group or a family-run business that may already be in this country, for a significant die-caster to establish operations here, be it Teksid or one of its competitors, it is not really a case of coming up with $50 million or $100 million or $200 million; it is a case of lining up contracts for sale, be they domestically, or offshore, or a combination of both. It becomes very complicated. It is not a case also of just putting in a building and establishing various die-casting machines. With the main auto companies, some of them like a particular die-casting technology and others do not, so you cannot just have a machine there, you really have to start from the back and go forward—the contract first and then come through to the facility.

CHAIR—Do we suffer not being close to the market?

Mr Howard-Smith—It has an effect more to do with most large consumers now. When I say 'large consumers', I mean the tier 1 suppliers as distinct from the auto manufacturers. The tier 1 supplier are the groups that provide finished or semifinished modules for assembly. They are the real key. Those groups tend to concentrate or congregate around the final assembly plants. So

when you have a subcomponent that is a fair distance away, you have to have a fair amount or a lot of working capital tied up in a supply stream. That does have an effect, certainly.

Mr ALLAN MORRIS—Can we go back in history, because I want to clarify in my own mind something that occurred some years ago.

Mr Howard-Smith—Yes.

Mr ALLAN MORRIS—From recollection, the funding of the pilot plant at Gladstone with CSIRO was something like $24 million or $25 million from AIDC, which was a special grant from government at the time, a similar amount from Ube Industries from Japan and a smaller amount from Queensland mining. Can you give us the history of that, because in among all the paperwork the contribution of the Commonwealth seems to have been lost. I am really interested to know who actually owns that contribution these days, because no-one seems to be able to tell me anymore. It seems to have been perhaps given away or forgotten about.

Mr Howard-Smith—Far from it, but bear in mind before I answer that I do not represent AMC—

Mr ALLAN MORRIS—But you were there at the time.

Mr Howard-Smith—But I was the managing director at the time. The sequence of events was that QMC—Queensland Metals—funded for a long period of time the base technology. We did, in fact, reach an agreement with Mount Isa Mines and Ube in late 1991 going into 1992 whereby both MIM and Ube jointly would provide $25 million as long as we were successful, essentially, in having the government—the federal government, $20 million; the Queensland state government, $5 million—to basically fund one to one. The technology that was developed is in fact owned by the CSIRO and AMC. There is a royalty payable to the CSIRO from the use of that technology, which is based on cents per pound of production. Again, I could not tell you today what the payback is but, when the plant comes on stream in 2003, from day one the CSIRO should receive a royalty. The government does receive back its funds through the CSIRO.

Mr ALLAN MORRIS—But the original funding was from the AIDC?

Mr Howard-Smith—No, the AIDC was involved on the periphery. That arrangement was negotiated directly at the end of the day with Mr Crean, Senator Button and the federal cabinet.

Mr ALLAN MORRIS—But as to the actual vehicle for putting money in, I did not think it was a grant at the time. I thought it was channelled through the AIDC, who would have kept some of the ownership of the intellectual property.

Mr Howard-Smith—Government funds, both state and federal, were channelled through the CSIRO. I must admit that I do not recall the AIDC being there as an intermediary, but it may well have been.

Mr ALLAN MORRIS—It may have pulled out. It may have switched across to the AIDC. So what you are saying is that the CSIRO owns the property and is getting a royalty; therefore, the taxpayer is getting a payback from that investment?

Mr Howard-Smith—They will.

Mr ALLAN MORRIS—I was trying to justify governments putting money into research, that is, whether you can say they can get something back in the end and that they are not just giving it away?

Mr Howard-Smith—That is right.

Mr ALLAN MORRIS—That is not being recognised much in this industry at the moment. I am trying to encourage more investment by government rather than less investment.

Mr Howard-Smith—Certainly, as to the other parts of that deal with CSIRO—QMC, going back in time when we set that up originally in the very late eighties, 1988, structured a 13-year arrangement with the CSIRO to help us not only with magnesium metal but also with all derivatives of magnesite and magnesia.

Mr ALLAN MORRIS—What happened to Ube Industries?

Mr Howard-Smith—As to both Ube and MIM, you might recall that back in 1994 Japan was going through a very rough time and Ube Industries was not alone. Virtually for the first time since World War II it forwent a dividend in 1994 and 1995. It literally took the view that the future investment in magnesium was too much; that it could not handle it when it was in such bad shape. Mount Isa Mines was in a similar position in 1994 and also pulled out. I can tell you that that certainly was not one of the most brilliant years in QMC's history.

Ms ROXON—I am interested in the comments you made about the process for decision making about what sort of plant might be set up in Australia. You commented that it is really a process of getting the orders first and then making a decision. How does that tie in with a view that we keep hearing from other industry representatives that it is very difficult to get venture capital into Australia? Does it mean that for your decision-making process the venture capital issues are irrelevant and that it is really more based on making sure you are going to have ongoing customers? What are your views on those sorts of issues?

Mr Howard-Smith—You basically have two areas that you look at. If you have a very large company of substance, as Teksid is, essentially the raising of capital for investment is not so much of an issue if you have a contract to give you confidence. That is the total way of business of the Teksid Group and the Fiat Group. They have a contract first and, on the contract, they build a plant. Whereas smaller groups in, let us say, in Australia, where there are a lot of family owned casters, in some cases tend to have a lot of trouble raising capital in the first place. It is difficult to get large-scale contracts in Australia because the market is so small. Perhaps I should say that one of the things that Teksid has been looking at—and we are still looking at—is whether it makes sense to look at possibly an acquisition in Australia of an existing casting business and then to grow it slowly. That may or may not be the case. In aluminium casting, for instance, the largest company in Australia to produce castings is Nissan in Dandenong in

Melbourne. That organisation has a capacity of about 10,000 tonnes per year of componentry. Last year it might have produced 5,000 or 5,500 tonnes. In the scheme of things that is an extremely small plant. You may be able to grow it, but it is very small.

Ms ROXON—I was trying to grasp whether people are saying there is a difficulty in raising venture capital because Australian business or investors are not keen to do so or because culturally there might be some hesitation or because there is some other impediment to it. Your comments seem to support—and correct me if I am wrong—the view that when you are dealing with a multinational business like yours there is not any impediment to spending the money here and raising the money is fine, but really there are a whole lot of other factors that you are going to weigh up.

Mr Howard-Smith—That is true.

Ms ROXON—But obviously smaller businesses are in a different position.

Mr Howard-Smith—That is true.

Ms ROXON—I am interested to hear that, because it is unlike some of the comments we have had from other people. But your industry is quite different.

Mr Howard-Smith—It is essentially a manufacturing industry. It is R&D on the periphery. Obviously, any company worth its salt will continue doing research and development to improve its process or what have you. To all intents and purposes, casting a part, machining it and finishing it is a known technology. As I say, you are simply seeking the security of having major customers and long-term contracts.

Perhaps the other thing I should say in overview rather than anything else is that, using Teksid as the example because it is the one I am most familiar with but also all of Teksid's competitors, of which there are a number, if those companies have $100 million or $200 million to invest in casting facilities, today most of them would not be interested in Australia, the reason being that we have a very small domestic market, which is a fact of life, and we are a reasonable way away from potential large consumers. So most companies would look at going into markets where there is an existing large end consuming group—North America, Europe, and possibly Asia.

Teksid's view, for what it is worth, was to look further down the track and to say, 'We know today, because we are so heavily involved in the industry, where the auto makers have their facilities. Where tomorrow might they have them?' Teksid is no different from all of the others in this business in recognising that Asia in the broader sense—Malaysia, Indonesia, the Philippines, China and India included—will over the next 10 to 15 years become a very significant auto manufacturing region and also a very significant auto sales region. Teksid's position in a nutshell was to say, 'We wish to establish a foundation in Asia for the future.' Teksid people living in Italy are a long way from anywhere here. They simply really do not understand and they do not have time to focus. They pick up the papers and see that Indonesia is in upheaval or that something is happening in Malaysia.

Teksid's view is that it makes sense long term to have basically two arms. You have facilities in Asia, in the broader sense, and potentially facilities in Australia. If it is possible to have both areas producing exactly the same component you can go to a major end consumer that wants a million cylinder heads or a million finished engines and effectively supply half a million out of Asia and half a million out of Australia and thus give security of supply and an interesting blended cost of production. I know I am tending to carry on, but just to set the scene, it is an unfortunate fact of life that if we produce car parts in Australia they will cost more today than if we produce them in the Philippines, Indonesia or Malaysia.

Mr IAN MACFARLANE—What is the major contributor to that increased cost?

Mr Howard-Smith—To all intents and purposes, wages. They are considerably lower in Asia.

Mr IAN MACFARLANE—So energy costs are comparable?

Mr Howard-Smith—Very much so.

CHAIR—Given that point you have just made and given that AMC are well down the track with your plant at Rockhampton and the agreement with Ford, what opportunity will there be in the foreseeable future for smaller manufacturers in the Australian market?

Mr Howard-Smith—For magnesium?

CHAIR—Yes.

Mr Howard-Smith—As my AMC friends will doubtless tell you this afternoon or whenever, the Ford contract with AMC initially takes precedence. So when that plant comes on stream, until it produces plus 45,000 tonnes of alloy, essentially Ford take the lot. Only after that do other customers have a chop. So in the short term what Ford want to do with their magnesium is the whole key. If it makes sense for them to cast parts in Stanwell outside Rockhampton or, indeed, take them to Geelong, Canada or Singapore, that is totally in Ford's hands as far as I know, because we deal with them all the time through Teksid. Ford at this point in time have not made their own decision. Longer term, I still believe there is—

CHAIR—Before you move on, are you suggesting that the government should be talking to Ford right now on that particular matter to make sure that that second stage stays in Australia; we will encourage them to keep that second stage in Australia?

Mr Howard-Smith—I think it would be a very good idea, yes.

CHAIR—Sorry to interrupt. I just needed to find that out.

Mr Howard-Smith—The original idea with establishing AMC was to go from magnesite to magnesium alloy components in the same company. Once that is broken where you have AMC or, indeed, any metal producer whether it is aluminium or magnesium, their focus not surprisingly is to produce metal and to give a return to their shareholders. They do not really

care whether their metal is die-cast in Australia or it is die-cast on the back of the moon; it does not matter to them. Their whole focus is really to return money on producing ingot. That is a worry inasmuch as that is what has happened in Australia in relation to a whole lot of metals. So you have a die-caster who is in the centre, an end consumer or a customer dealing with the smelter where he is buying metal and the die-caster normally is just toll treating it and for the die-caster to buy metal from the smelter, it is looked upon as any other contract; there is no incentive to get lower cost, and that is a worry.

CHAIR—Do you think government should step in and give an incentive or consider an incentive by way of a tax arrangement if that next stage stayed in Australia? Ultimately, if it did it could be argued that the government would pick its tax up, anyway, if it were profitable.

Mr Howard-Smith—That is right. There are a number of potentials. I am not sure if I can follow through as to how government would give an incentive on a metal price, particularly magnesium, because there is no price. There is no LME—there is no set price world wide. You either have a contract or producer to purchaser contracts, and they are purely between company and company. You normally have a producer list price—

CHAIR—If I can interrupt there, I was getting the feeling that you were saying that in other countries, whether it is because of attitude or culture, there is a better degree of vertical integration, but there does not seem to be in Australia. The attitude seems to be: export the ingot and let someone else do the rest of the work. Do you agree with that? If so, is there a way that we can change that culture in Australia so we work harder to make sure that we get the total value added?

Mr Howard-Smith—It is my personal dream that that happens, that we do go downstream and we do produce components. It has to make economic sense. If government can provide incentives, that can certainly help. As to what they might be, I have no idea.

Mr ALLAN MORRIS—You would have done some sums by now on alternative costs. Looking at Japan, for example, where wages are actually higher than here, I would have thought that the AMC technology is offering about a quarter of the production cost of the magnesium metal itself. We must be starting to be competitive with a number of those countries in terms of component manufacture.

Mr Howard-Smith—The production costs for magnesium are certainly of interest to the producer, but at the end of the day the consumer does not really care whether the production costs were 50c a tonne or $1 a tonne.

Mr ALLAN MORRIS—In terms of feeding through into the actual cost of the component, of the end product, whether it costs more to freight the raw material or to freight the finished product, if the aluminium costs are low, if the magnesium costs are low—and the wage costs are probably lower than for Japan; the energy costs are certainly lower—I would have thought that, looking at say the Japanese market or the American market, unless there are trade barriers like tariffs and so on, we must be getting close. I would have thought that Teksid would have done some of those sums already on some of those possible markets for its production in Australia.

Mr Howard-Smith—We have certainly looked at Japan. You do have in Japan a large end market and you have existing facilities. Yes, the costs are higher, and indeed probably one of the last places you will find further automotive investment of any sort is in Japan. Over the next 10 to 12 years most of the capacity will come out of that country.

There are a number of magnesium alloys, obviously. Today with Western producers or Russian producers, you can buy magnesium alloys anywhere from $1.05 up to about $1.30 a pound. You can get exactly the same alloy now out of China from $US0.80 to $US0.85 a pound. So you have a huge range today. What I think Teksid is looking at is going beyond just today and the huge price differences and saying, 'Yes, Australia offers metal, but most of all it offers political stability. So if you put your capital in here, in 20 years time you will have it, whereas with the other countries in the region you may or may not. Who knows? But you will certainly have a lower cost of production in the meantime, so why not look at both?' That is our entire strategy.

Mr ALLAN MORRIS—The chairman has been asking you what the government can do. I would have thought that all the sums have been done by Teksid. You have obviously spent a bit of time on it, and your submissions to us were very interesting. Yet you are saying that it is still not right—I think those were the words you used. I guess I am asking if we can get from you the key parameters that we might address to try to make it brighter, or are they unaddressable? There must be ways in which countries like ours can actually understand this better and be more effective at it. Is it impediments or lack of incentives? Which is it? Can we try to pin those down? Maybe today here and now you cannot do that. It may be that you will want to drop us a note and say, 'You should look at this and this and this.' It seems to us that after talking to you today and after talking to Professor Dunlop, we are not getting any clear guidance as to what we can address. Whether it is because we are not focused enough or we have not thought about it, I do not know.

Mr Howard-Smith—Unfortunately, I do not think it is possible to get any absolute clarity. It is a quite convoluted situation. Of Teksid's two most recent plants that have been built—one of them is currently being built—one of them is in Alabama in the US, and that is essentially for General Motors for the next 10 or 15 years for a particular engine. That plant is worth $US110 million. The state of Alabama is providing $110 million over the first eight years. There are no state taxes. The second most recent plant was built in Italy in the Aosta Valley. The last place you would expect a die-casting plant of any description in Europe is in the Aosta Valley. It is 100 kilometres out of Turin with the Matterhorn, Roman castles and god knows what else just across the road. You would not expect a die-casting plant there. You have to bring the metal in, die-cast the parts, take the scrap out and take the die-cast parts out. But the reason it ended up there was that the local Aosta authority and the Italian federal government joined forces. They provided Teksid—in this case, through the Meredian magnesium die-casting group—with the land for nothing. They put the building up. They provide all services such as gas, electricity, roads, finances, fences, et cetera, to this facility. They will subsidise wages and inputs for the next 10 years. Essentially, Meredian just had to put in die-casting machines. This is what happens in the die-casting industry.

Mr ALLAN MORRIS—That is a bit hard to match, isn't it?

Mr Howard-Smith—It is. This is the problem particularly in Australia, either federally or at a state level. It is hard to match, but that is what is happening. Take Mexico as another example. In the last 10 years Mexico has had almost $US20 billion invested in automotive manufacturing or component manufacturing. There are a number of reasons for that. Again, it has very low gas and electricity costs. The land is for nothing. Depending on which state you put your plant in, you can get the building for nothing. Technical people such as very heavily qualified engineers are paid $US15,000 a year. That is the total cost. This is a problem that we are faced with here that we cannot essentially do anything about.

Dr WASHER—I was fascinated by the fluctuating price of magnesium throughout the world, yet I believe aluminium is controlled by the London Metals Exchange. Is that true?

Mr Howard-Smith—Essentially.

Dr WASHER—How did that work out? Why is magnesium not part of that? What is the history?

Mr Howard-Smith—It is more historical. Without boring you for hours and hours, at the end of World War II the number of tonnes of magnesium and aluminium produced in the US was pretty much the same—300,000 or 400,000 tonnes. In 1946 the magnesium market collapsed because it was easier to produce aluminium. There was more hands-on knowledge with what to do with that metal. It has just continued going up and up and up. But the world market for aluminium today in total is about 25 million tonnes of primary and nine million tonnes of secondary. So 34 million tonnes of metal are circulating around the world, whereas the total for magnesium is 400,000 tonnes. So it is very small. It is climbing its way up a very slippery slope at the moment. As Gordon Dunlop pointed out, there are a whole lot of technologies out there—a very limited number of countries but a whole host of technologies. China, unfortunately, has extremely low labour and can produce it very cheaply. Whether in the long run that will continue is in the lap of the gods, but it is a fair bet that it will continue producing very cheap magnesium.

Dr WASHER—Just to follow that, I would not have thought that die-casting was all that labour intensive. What sort of labour force would a reasonably sized plant require?

Mr Howard-Smith—Again, depending on the technology, but an aluminium plant that produces, say, two million cylinder heads a year in secondary aluminium needs about 800 employees all up. What has been found over the years in fact is that, like most manufacturing operations, there is an optimum size for the number of employees, and dealing with management, et cetera, but that is about it. So 800 employees making two million cylinder heads is about a 20,000-tonne finished component plant. The capital investment there is $US120 million.

Dr WASHER—You said that your great love has been magnesium. I guess that is because of its lightness in spite of the cost. I gather that that is also because its ease of casting is better than aluminium, as is its machinability. Can you elaborate on that? Why do you feel it has a greater future?

Mr Howard-Smith—Its main attribute is its lightness. There are other light metals, but they are even more expensive than magnesium. As you say, it is easy to cast. It can create an as-cast part that needs very little machinery and finishing whereas with aluminium they normally come out with bits and pieces all over them. It is hard to say, but magnesium itself is not a wonder metal. It is not going to take over every part of the car by any means. It will be used by the end consumer where it makes sense. What they mean by where it makes sense may be different from the committee's view. What an automotive maker wants is a cheap part that will give him security, safety and lower warranty costs at the bottom of the table, but if it is also lighter, that is good. But it is never up the top. There are certainly some specific components which, if made from magnesium, would make a lot of sense—for instance, instrument panels where you can cast a very wide piece that has very good dimensional stability. You cannot do that with aluminium. Some of those components are as cheap as their steel equivalent. Some are a little bit more expensive, but that is one particular area that is being focused on. However, there are not a lot of components like that in an automobile.

Mr IAN MACFARLANE—In terms of carbon composites and fibre composites, is that where we are going to see growth? Do you think that alloys have peaked in motor vehicles and we will now move on to the next wonder material?

Mr Howard-Smith—I wish I could give you a simple answer to some of these questions. There are not simple answers. To answer your question first of all, yes, but there are reasons. If you take General Motors, Ford or Daimler Chrysler, the large auto companies have their own platforms and their own platform managers on top of those. You then come back one step and you have your tier 1 supplier who is supplying all the different modules—the instrument panels, the seats, and even engines sometimes. With the various members of these different platform groups and the various divisions within the tier 1 suppliers, there are some people who are total supporters of magnesium. There are others who are total non-supporters of magnesium. There is also a huge group in the centre who do not care whether it is magnesium, aluminium or carbon fibre as long as they can produce a part that meets the specification requirement of the end consumer, who, in recent years, does not really, in many cases, specify what goes into it.

Mr IAN MACFARLANE—In terms of the government regulating the weight of the motor vehicle, for instance, which may be seen in the short term as a great boost for the alloy industry, it may be an even greater boost for the fibre composite industry.

Mr Howard-Smith—As long as the price is right. The steel industry is a huge industry world wide with a lot of associations and a lot of consolidated R&D over centuries, but over the last 20 or 40 years automotive makers have focused on the development of new steels. In the last five years, half the steels used in automobiles today did not exist. They have been introduced. They have brought out lightweight steels so you get extreme safety. People have grown up with steel. They know how it performs. They know that if they do this that will happen. It is difficult to get over the fact that there might be new materials, whether it is carbon fibre, thermal plastics or magnesium. They tend to put it aside. Whether it is here, in Europe or America, under CAFE to legislate to lower the weight to reduce fuel usage and emissions is certainly one way that is gaining currency, but you can lower the weight, as you say, with carbon fibre, plastics and aluminium in all sorts of areas.

Mr ALLAN MORRIS—I want to switch topics. We have been canvassing the idea of cost and locational factors and so on. I want to take another angle and look at the content. I am not sure if you were here for all of Professor Dunlop's evidence, but we partly canvassed with him the actual metal content and technology to apply metal extrusion. You may have heard my question about the security for that kind of technology—if we developed technology for extrusion which was then pirated by someone else. That is my first question.

The second part is: are we better to try and offer people such as Teksid cleverer ways of doing things or is that not realistic? That question about extrusion not being used much in magnesium seems to be a potentially important one, but would it be better to try to look at the science of the content of the alloy—like the engine block example someone gave—and/or the way we actually apply it to make components or to make things?

Mr Howard-Smith—Yes. Australia has shown, without blowing our own trumpet, that in certain areas we can come up with world-class technologies. In light metal R&D, particularly magnesium R&D, Professor Dunlop and the CAST group and CSIRO itself have done a wonderful job, but we are not doing it in isolation. Israel, Germany, France, the United Kingdom, the USA and Europe generally all have large-scale magnesium R&D activities under way. Gordon collaborates and talks with these other groups.

Your point about extrusions is particularly interesting because that is one area that we believe will come. In World War II the Germans, who were the leader for many years in magnesium technology production and use, produced enormous quantities of sheet extruded magnesium casts. Believe it or not, with the end of World War II most of the technicians, most of the experience and most of that equipment ended up in Russia. That has been totally closed for the last 30 or 40 years. The Russians in fact had a lead on us in extrusion.

The other problem was when magnesium use just collapsed after World War II. It only came back in in the 1970s. That was after computer databases were set up. Scientists find it very difficult these days to go back and look through libraries and printed material. Crank up a computer and you will find five or six references to extrusion, whereas 50 years ago there was a lot of extrusion. Certainly Teksid believes that there are long-term wonderful prospects for extrusion in sheet in magnesium.

Mr ALLAN MORRIS—But world wide, not necessarily in Australia. Our capacity to have the intellectual property which would give us some say as to where it might happen is not great.

Mr Howard-Smith—No. But the other part of the reason is that, because magnesium is a very light material, if you make a component you get the volume but the weight is low. You can fit only a certain amount in a container and you pay for that container not by weight. So you can fill it up with steel or aluminium and actually get a benefit by having aluminium components. We run around in circles at the end of the day.

CHAIR—We are starting to run out of time. Do members have any other relevant questions? We have in our papers several documents forwarded by Mr Howard-Smith. It is resolved that the documents presented by Mr Howard-Smith be accepted as an exhibit to the inquiry. Ian, thank you very much for your presentation this morning.

Mr ALLAN MORRIS—Can we encourage Mr Howard-Smith if he wants to make any more material available or if he has any thoughts after he reads the *Hansard* to drop us a note? You can see that we are grappling with a very delicate situation, as you have been. Any insights would be great.

Mr Howard-Smith—Government and industry are at one here. We are both grappling.

CHAIR—You will be sent a copy of *Hansard*. If you find there is any inconsistency with what you have said, let us know. You cannot change the text but you can correct terminology used in your discussion. Thank you very much for your presentation.

Resolved (on motion by **Mr Ian Macfarlane**):

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

Evidence was then taken in camera—

Committee adjourned at 11.31 a.m.